VOL. XXXI NEW YORK—THURSDAY, OCTOBER 22, 1914—CHICAGO No. 17

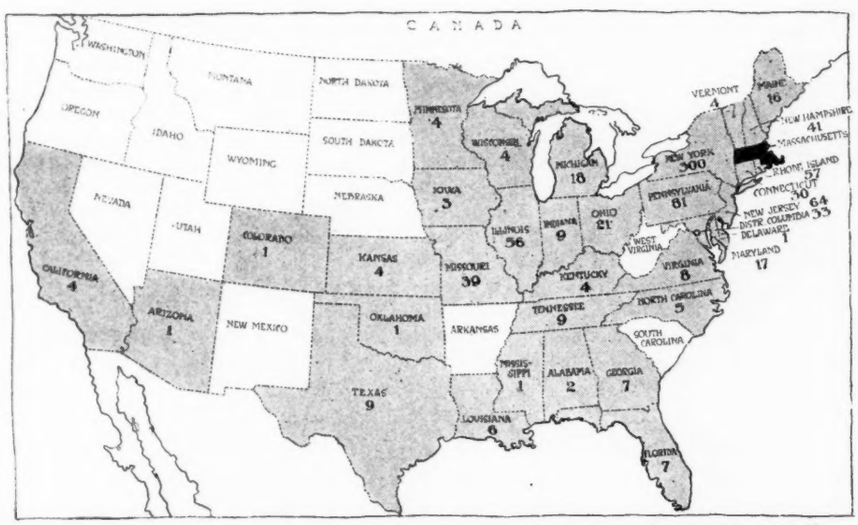
The AUTOMOBILE

New England–Tourists' Realm

72,790 Visiting Cars, from Nearly Every State in the Union, with 129,400 Owned in New England Bring a Revenue of Over $8,000,000

By James T. Sullivan

BOSTON, MASS., Oct. 1—If anyone were to state casually—having in mind that these are supposedly not very good times for business—that in 2 months this summer, July and August, automobilists spent more than $8,000,000 while touring in New England it would seem like a very exaggerated statement. Yet conservative figures place the sum at that amount. When one figures that there were more than 202,000 cars on the highways of that section in 2 months, or some 12 per cent. of the entire registration in the United States, some credence must be given to the amount spent.



Shaded portions of the map indicate states represented by automobile tourists in New England during the past summer, figures giving the number of cars

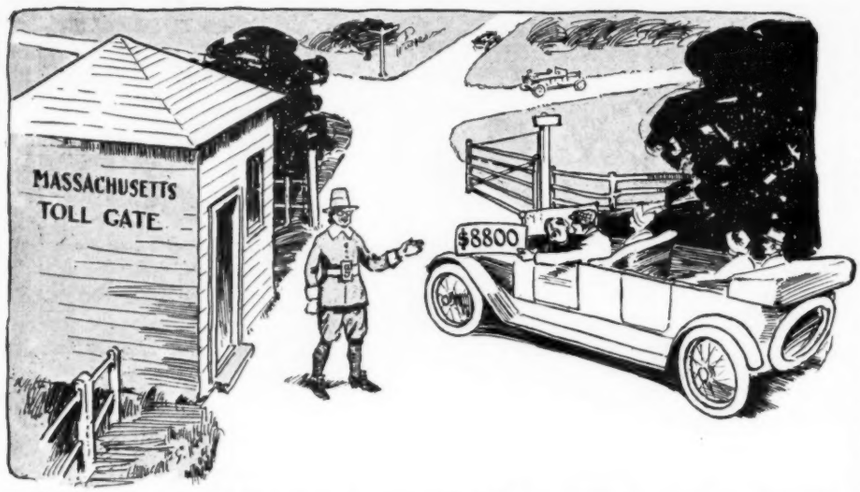
129,400 Cars in New England

On July 1, admittedly the beginning of the touring season, according to THE AUTOMOBILE, there were registered in this country 1,548,350 cars. Now it is not stretching a point too far to say that in the next 2 months the registrations all over the United States put the figures close to 1,600,000. Taking that for granted the registrations in the New England States totaled 129,400, or about 8 per cent. of the total registration. By a process of deduction to be explained later some 72,790 visiting cars toured that section, making a total of 202,190, or about 12 per cent. of all the cars owned in this country.

Giving each car an average of three passengers it makes a total of 606,570 who were making trips. It is not putting the figure too high to say that each car used up at least $1 worth of gasoline and oil a day. No account is taken of the money spent for meals, hotels, etc., for the writer wants to keep his figures as conservative as possible. Certainly many cars showed a daily expenditure of its occupants, even if only three, for car and occupants together as high as $15 a car or more. So when the figure is held down to $1 it more than counterbalances any idea of exaggeration.

$8,491,900 Spent on Tours

Therefore taking the 129,400 cars owned by New Englanders, and which were daily on the road for 60 days, it gives a total of $7,764,000 at the $1 a day average. Adding to that the 72,790 visitors, and allowing that they spent at least 10 days on an average here, and it gives $727,900 more, a total of $8,491,900 for the summer. That is the reward New Eng-



Owners of cars from other states contributed $8,800 in license fees to the state of Massachusetts alone during the past summer

land is reaping for opening to tourists her shore resorts, splendid boulevards and state highways. And if there is one real convincing fact, that proves more than any other that New England is the Mecca for motorists yearly, it is found in the figures that show that in 3 years, out of all the states and territories comprising the Union only ten were not represented in the list of non-resident registrations in Massachusetts, and these non-residents registered were those who came here to stay for a period long enough to take out such a license. In that same period eight foreign countries were represented. The ten unrepresented states were in the Far West where motoring has not taken a very strong hold.

A 1-Day Census in Maine

However, it is the figures that count. Maine now has approximately 14,000 pleasure cars registered. The Maine State Automobile Assn. officials take a great interest in motor affairs, and a year ago a census was taken of cars on various roads. This year there was other important work on hand and it was not possible to give the time to a similar census. But just to get some data on 1 day in August, not a Sunday or holiday, a man was stationed for 2 hours on the road several miles from Portland to make some statistics. In that time he noted 125 cars coming into Maine and 115 leaving, all non-resident machines. There were about 150 Maine cars passing in both directions also. Taking that as a basis, and allowing that it was for 2 hours only, it gives a total of 240 foreign cars. Multiplying that by 60 gives 14,400 for 2 months.

New Hampshire Is Popular

New Hampshire had 1,157 non-residents registered in 1913 and 1,200 this year up to September 1. That state watches visitors carefully, and they have but 10 days to remain in the state without taking out a license. As it is a very popular touring section set in a place where it is bordered on all sides by states having many motorists it is not putting the average too high to say that for each one registered there were at least twenty-five who went through without registering. That would give a total, including the registered ones, of 31,300. For Vermont it would not be over-estimating the figure to say that 50 per cent. of the New Hampshire visitors crossed over into the other State, it being so near, and has so many attractions. That would give some 15,600 cars. From New York State with its immense registration and other New England States it is not claiming too much to say that some 4,400 cars went in and out, giving a total of 20,000. The non-resident law is so broad that few take out registrations and no separate list is kept of them. Vermont has about 8,000 cars registered.

Massachusetts is recognized as the pioneer touring place because of its splendid roads built for many years, and its fine summer attractions. So it is not surprising that its figures would exceed all others. To get to some of the other states the Bay State must be traversed. Until this year the law allowed but 10 days for motorists to stop without registering. This year when many visitors came here they found that the law had been changed to 30 days. At first it seemed a very hospitable act. But it had its joker. The non-resident with 10 days only could register for 3 months at a reduced fee. This year, if he remained more than 30 days, and many of them did, it meant paying an entire year's fee. It created a rumpus. At first it was thought that the total of non-residents would dwindle, but they did not. On the separate list this year, those registering for 1 month, there were only thirty-nine, but the total for all non-residents who had to pay the yearly fee ran up to 880. This was an increase of 140 over the same period in 1913.

Now it is well known that for every car registered to stay 2 or more months there are some fifty cars that come in and out of the state for short periods. This year they seemed more numerous than ever about the streets and around the hotels. On Sundays there were constant streams of them heading over our boulevards. So multiplying the 880 regulars by the fifty transients and one gets, including the 880, a total of 44,880. The state registrations show about 60,000 pleasure vehicles.

Connecticut, being the entering state from southern New York and the South, many of the visitors to New England pass through there. Others go through there leaving New England. Then there are many others who go from New York for brief visits to summer homes along the Sound, and others from Rhode Island. If we take 50 per cent. of the Massachusetts visiting cars it gives 22,440. And certainly from New York and Rhode Island during the 2 months there are at least 2,560 to make a total of 25,000. The state registration is some 23,500. Rhode Island has a lot of shore re-

Non-Resident Tourists Visiting Massachusetts

	1912	1913	1914		1912	1913	1914
Alabama	2	0	2	North Dakota	0	0	0
Arizona	0	0	1	Ohio	40	29	21
Arkansas	0	0	0	Oklahoma	0	0	1
California	7	4	4	Oregon	0	0	0
Colorado	2	0	1	Pennsylvania	78	80	81
Connecticut	43	43	30	Rhode Island	42	42	57
Delaware	0	2	1	South Carolina	0	2	0
Florida	3	8	7	South Dakota	0	0	0
Georgia	1	2	7	Tennessee	6	5	9
Idaho	0	0	0	Texas	8	10	9
Illinois	39	45	56	Utah	0	0	0
Indiana	3	7	9	Vermont	2	4	4
Iowa	2	5	3	Virginia	5	5	8
Kansas	1	9	4	Washington	0	0	0
Kentucky	4	9	4	West Virginia	0	1	0
Louisiana	4	3	6	Wisconsin	1	2	4
Maine	3	6	16	Wyoming	0	0	0
Maryland	17	16	17	Dist. of Col	12	23	33
Michigan	15	13	18				
Minnesota	2	4	4	*Foreign:*			
Mississippi	0	0	1	Canada	2	3	7
Missouri	40	41	39	Puerto Rico	2	4	3
Montana	0	0	0	England	0	1	1
Nebraska	4	3	0	Germany	0	0	1
Nevada	0	0	0	Portugal	0	0	1
New Hampshire	12	10	41	Cuba	1	1	3
New Jersey	56	80	64	Honolulu	1	0	0
New York	209	220	300	Brazil	1	0	0
New Mexico	0	0	0				
North Carolina	0	2	5	Totals	671	744	879

sorts, among them Newport and Narragansett Pier. Others not so well known, however, are very popular for Massachusetts and Connecticut motorists. So by a further process of deduction by taking 25 per cent. of Connecticut visitors, giving 6,250, and allowing 3,750 from Massachusetts and Connecticut regular registrations one gets 10,000, not a very extraordinary number. The state has some 14,000 registrations, so it is quite a motor section. All non-residents are merged with the regular registrations. From these figures one gets the following statistics:

New England Summer Figures

	STATE REGISTRATIONS.	VISITING CARS.
Maine	14,000	14,400
New Hampshire	9,900	31,300
Vermont	8,000	20,000
Massachusetts	60,000	44,880
Rhode Island	14,000	10,000
Connecticut	23,500	25,000
Totals	129,400	145,580

Now if 50 per cent. of the visiting cars are dropped as being machines which have duplicated by touring various states, or comprise also New England cars, it leaves a total of 72,790. And so, adding this latter figure to the state registrations, it gives the 202,190 cars touring in New England. And by multiplying each car by three one gets 606,570 motorists on the roads this summer.

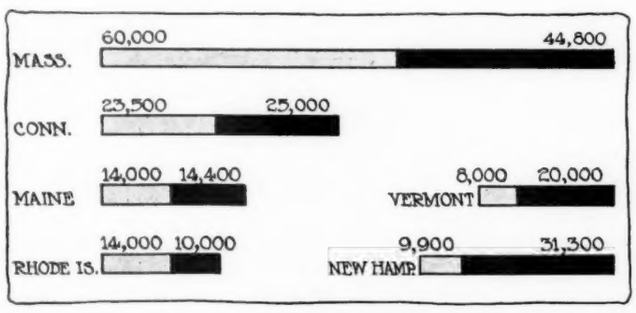
Here are the recapitulated figures:

Cars on the road, resident, daily	129,400
Cars on the road, non-resident, 60 days	72,790
Daily expenditure, resident	$129,400
Total expenditure, resident, 60 days	$7,764,000
Total expenditure, non-resident, 10-day average	$727,900
Total cars on road for summer	201,190
Total expenditure, all cars, all summer	$8,491,900
Total motorists touring, all cars, all summer	606,570

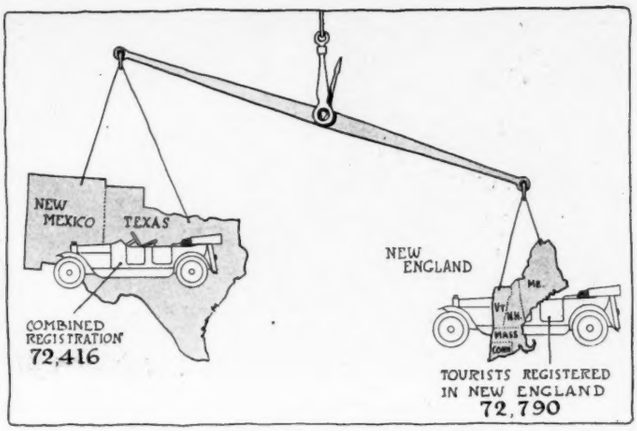
As New Hampshire registers her non-residents from the place where they happen to be staying while in her state, and Massachusetts gives the home address of visitors it is through the registrations on the Bay State books that one gets an idea of the cosmopolitan character of the visitors to New England every summer. The figures show that in 1912 there were twenty-nine states represented on the regular non-resident list. There were five foreign countries represented. Last year the number had been increased to thirty-one with but four foreign countries. This year there are thirty-three states on the list, with six foreign countries. The non-residents in 1912 were 671; in 1913 they jumped to 744, and this year the figures show 879. They would have gone higher but for the new law. The foreign countries represented during the 3 years comprise Canada, Porto Rico, England, Germany, Portugal, Cuba, Honolulu and Brazil.

New York Sends Most Tourists

For purposes of comparison the various states have been grouped together somewhat geographically. They give some interesting tables for a 3 years' comparison. New York, as a state, individually leads all others every year, having about



The shaded portions indicate the car registration of the New England states, while the black sections represent the number of visiting cars during the past summer



Cars from other states visiting New England last summer totaled 72,790, or more than the combined registration of the two great states of Texas and New Mexico

30 per cent. or more of the total. The other two big states are Pennsylvania and New Jersey, they being even with eighty each a year ago, but the former gaining one this year and the latter losing sixteen, dropping into third place.

The first group chosen naturally is New England. Maine made a big gain of ten, New Hampshire, thirty-one, Rhode Island, fifteen, Vermont remaining the same and Connecticut dropping thirteen. So the total is 148, a gain of forty-three over last year.

New England Group

	1912	1913	1914
Maine	3	6	16
New Hampshire	12	10	41
Vermont	2	4	4
Rhode Island	42	42	57
Connecticut	43	43	30
Totals	102	105	148

The Atlantic Coast group also shows a gain. Alabama and Mississippi are added this year, the first time for the latter. The District of Columbia shows a gain of ten, which, with the gain of a few here and there, offsets the big drop of New Jersey, and so there is a total of 150, a gain of seven.

Atlantic Coast Group

	1912	1913	1914
New Jersey	56	80	64
Maryland	17	16	17
Florida	3	8	7
Virginia	5	5	8
Louisiana	4	3	6
Delaware	0	2	1
North Carolina	0	2	5
South Carolina	0	2	0
Georgia	1	2	7
Alabama	2	0	2
Mississippi	0	0	1
District of Columbia	12	23	33
Totals	101	143	150

The Middle West group also shows up well with its increase of eight over 1913. Illinois gained eleven, Missouri lost two, Ohio, eight, while Michigan gained five.

Middle West Group

	1912	1913	1914
Illinois	39	45	56
Missouri	40	41	39
Ohio	40	29	21
Michigan	15	13	18
Iowa	2	5	3
Minnesota	2	4	4
Indiana	3	7	9
Wisconsin	1	2	4
Totals	142	146	154

The border line group shows the largest gain, due to New York, the total of that state this year being 300, a gain of

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One of the shops in the Darracq factory at Paris used as a dormitory for the French soldiers

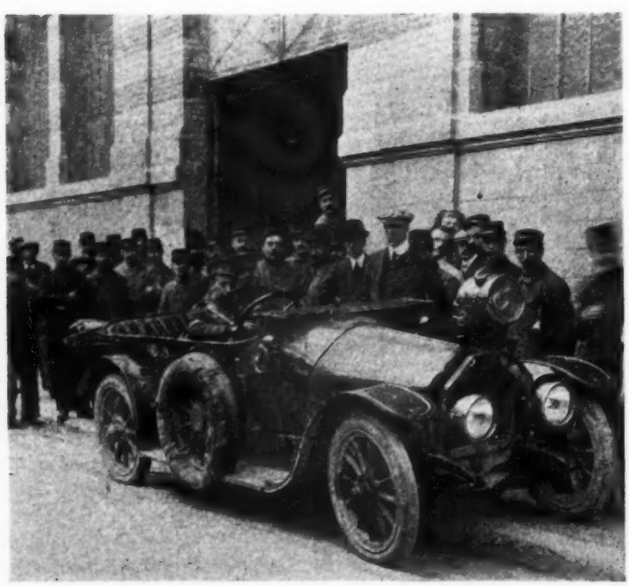
French Regulations Grow Stricter

Cars Confiscated if Rules Are Violated

By W. F. Bradley

Special Representative of THE AUTOMOBILE
with the Allied Armies in France.

PARIS, Oct. 7—Non-military motorists are being held down tighter than ever. It may be an inconvenience to the motorist, but it is a remarkable testimony to the value of the automobile. Individual passes to use a car are given out by the military governor of Paris and must be renewed every week. These passes allow the holder to travel within an area approximately 6 miles around the city walls. If the car is taken beyond these limits it is confiscated. Special passes for a single journey to some town which must be stated are given out after personal examination of the applicant. If the town is in the war district, the application is rigorously refused. Even for other parts of France, not at all affected by the war, the pass will not be given unless it is shown that the applicant has real business to perform. These single journey passes must bear the photograph and signature of each person carried in the car. If these regulations are not observed the car is seized and the occupants returned under escort to their homes.



Lieutenant Director of Supplies leaving the Darracq factory for the front

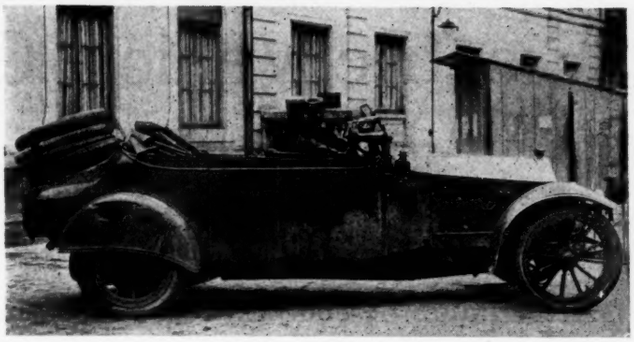
Up to quite recently a number of cars have been going out to the Aisne battlefield to bring in wounded to the Red Cross hospitals. Although the drivers of these cars were registered and were always accompanied by an officer in the British army, orders have been given that they must be withdrawn. In future the wounded will be brought in by hospital trains to suburban stations and carried from there to the hospitals by car. R. N. Goode, manager of the Packard company in Paris, was one of the first to volunteer to bring in wounded from the front. In connection with the American Hospital, he has made a journey every day for a month to the battlefields, bringing in from one to three wounded officers and men on each occasion. In common with others he will have to stop this useful work.

A Packard has been the victim of an unusual adventure. A special pass having been obtained from the military governor of Paris, one English and three American journalists were taken out to the battlefield. The officers in the field refused to recognize the pass given by the Paris governor. The journalists were sent back by train and put under parole not to write anything for 9 days. The car and chauffeur were retained, the latter being ordered to instruct another man to drive it. After being put to rough usage for a week, the car was returned to Paris, but the chauffeur was kept under military observation for a week longer.

L. K. Clarke, one of the demonstrators attached to the Paris Packard branch, also broke through the lines with a body of journalists. The newspaper men were sent back and the car was seized. Mr. Clarke volunteered to serve with the English staff as driver of the car. His offer was accepted, and for a time he remained near the firing line, dressed in the British uniform, carrying English officers from point to point on his American car.

The stringency displayed towards motorists appears to

arise from a fear of spies. A car is the most valuable adjunct a spy can possess. Only a few days ago a car entered Versailles carrying German spies disguised as British officers. Another party drove to the dock at Boulogne and were about to step on the boat for England when a slight mistake in their papers led to their arrest. In the districts where fighting is in progress it is absolutely forbidden for a civilian to take a car. In other parts of France the use of cars by civilians is cut down to the lowest possible numbers. In this way it is believed that a more rigid control can be kept on motorists and that spying and the spread of information can be arrested. People who have a need to travel and who cannot conveniently make use of the railroad are annoyed at the restrictions under which they are placed. They cannot protest effectively, for the military authorities will not admit discussion and newspapers will not publish their complaints.



Mercedes 60-horsepower armored car captured from the Germans and now used by French headquarters staff

Big Tire Business Expected After War

Goodrich Foreign Manager Thinks American Makers Should Reap Harvest

PARIS, Oct. 7—How the war has affected American tire interests in Europe was related to the Paris correspondent of THE AUTOMOBILE by Arthur Lumsden, general manager of the French and English auxiliaries of the Goodrich Tire Co.

"Our men had been paid as usual at noon on the Saturday France mobilized her army. At 4 30 o'clock the notices were issued putting the nation on a war basis. As our pay list is made up on Wednesday evening, arrangements were made for the cashier to be at the office on Sunday morning at 5 o'clock, in order that the men who were going to the front could collect their arrears of wages. In this way every man who left our works to go on active service went away fully paid.

"On Monday morning I was curious to see what the conditions would be at the factory. We found we had eighty men who were not eligible for active service. These men included most of those engaged in the band tire department. According to a previous arrangement with the French government, this department went under military control automatically as soon as war was declared, and we were put under an obligation to produce certain quantities of tires for army trucks." (This arrangement, it should be explained, is a part of the French army subsidy scheme. A couple of years ago Goodrich tires were admitted as part of the equipment of army subsidy trucks. Only the fact that the Goodrich company actually manufactures in France and has on its French board of directors men who have military responsibilities under the French law enabled this arrangement to be made.)

"London and Paris were violently panicky as soon as war broke out. The leading French tire firm, doing an immense business in England, called in all its stocks and refused to do business on anything but strictly cash terms. This move was followed immediately by the leading English firm. Deal-

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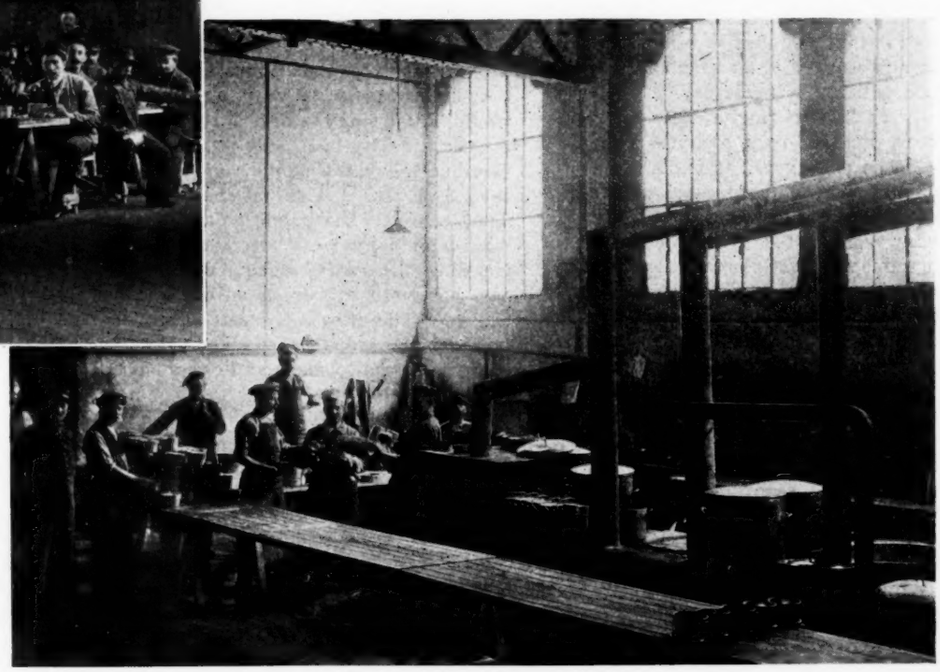


Above—Part of the Darracq automobile factory at Paris used as a mess room for the French troops

Right—Army kitchen installed in the washing room of the Darracq factory for the use of the French troops stationed there

Electric Vehicle Convention Opens—Over 400 Delegates Gather in Animated Session

Attendance of 500 Expected—Passenger Car, Truck, Battery, Parts and Accessory Makers Represented as Well as Central Station Interests

Interesting Papers Provoke Lively Discussion—More Activity in Building Business Urged

PHILADELPHIA, PA., Oct. 19—The fifth annual convention of the Electric Vehicle Association of America opened in this city today its 3-day session for the discussion of topics pertinent to the use of passenger and commercial electric vehicles.

By noon over 300 delegates had registered and it is expected that 500 will be in attendance before the convention closes. Those present represent the passenger and commercial vehicle departments of the industry, together with battery makers and other builders of component parts, such as motors, tires, frames and chassis necessaries. Over one-half the delegates are from central station interests, that is concerns in many cities manufacturing electric current for varied purposes.

More Activity Is Needed

The general sentiment among the delegates is that the electric vehicle industry has not progressed as it should and that more activity is necessary.

James H. McGraw, a New York publisher, read a very analytic paper, in which he endeavored to explain why the industry has not progressed as the conditions of the time warranted. Mr. McGraw regards the present condition of the industry unsatisfactory for three reasons: First, the novel character of the business has been depended upon to carry the business to a point where exhaustion has set in. Second, those responsible for the administrative conduct of the business have done little in a constructive or creative way to open up new lines of business and have depended too much on the routine of subordinates. Third, the central stations have not co-operated to the extent they should have in pushing the industry.

While considering the industry in its present condition Mr. McGraw thinks that all these ills can be corrected without superhuman effort, by simply applying to them such reasoning as will develop adequate comparison with progress made in other lines of business, and by adapting principles which have been known to bring results.

Dr. Steinmetz Answered

J. Crawford Bartlett, of Philadelphia, read a brief paper answering a paper read some months ago by Dr. Steinmetz, the eminent electrician of the General Electric Co., and one who ranks highest in the world in many electrical matters. In his paper Dr. Steinmetz prophesied the $500 electric that will travel 20 miles on one battery charge and have a speed of 15 miles per hour. He predicted 1,000,000 of such vehicles within 10 years.

Mr. Crawford in replying said: "Dr. Steinmetz predicted an electric of 20-mile radius for $500, and not an electric of 60 or 70-mile radius. I can take care of Dr. Steinmetz's $500 car for $7.50 or $10 per month as he prophesied. We had that kind of a car 10 years ago, but who would buy it today? Before 1909 I drove to Atlantic City in a 1,200-pound electric car, but today the public wants heavier cars and now I ride in one weighing 3,200 pounds. The public today does not want your puny, weak, electric, but is demanding the swift, sturdy, comfortable car that will go 75 miles on one battery charge. The greatest setback the electric vehicle industry received was the low-priced small vehicle of 10 years ago."

To Suit the Public

George H. Kelly, of the Baker Motor Vehicle Co., agreed with Mr. Bartlett that the public today wants the big car and not the little one. The electric vehicle makers are going to give the public what it desires in a car, rather than following a missionary course of trying to convince the public that it should use the light-weight, short-radius vehicle.

The Committee on Garages and Rates created much discussion when its report was read. The report contained a map of the Lincoln Highway, extending from New York to San Francisco. The majority of the report consisted of the tabulation of mileage on the Lincoln Highway, the ostensible inference to be drawn from the report as presented being that it was to show the possibility or impossibility of touring by electric from Coast to Coast. No sooner had the report been presented than George H. Kelly moved that it be laid on the table because the manufacturers of electric vehicles advertised their passenger cars for city use and not for country use, and that while the report on the map proved interesting information they were all wrong so far as the spirit of the electric is concerned. In America there are 225 cities of over 25,000 population, and in these the electric vehicle manufacturer should hope to make his sales for several years to come, and to these centers the association through its Committee on Garages and Rates should endeavor to assist the industry.

Animated Discussion

Immediately the convention was divided into two factions, those favoring the electric as a vehicle possible for touring, and those representing the industry considering it more in its present form as a vehicle for city use. P. D. Wagoner, of the General Vehicle Co., in siding with Mr. Kelly, believes that the public will not generally adopt the electric for touring purposes through the country until the speeds of the vehicles are higher than at present, and until batteries are perfected so that they will carry an entire day or until they are perfected along other lines which will permit them to be recharged or boosted in as long a time as it takes to fill a gasoline tank in a gasoline touring car.

The entire convention was not, however, of this belief. Day Baker, of Bos-

ton, Mass., and Treasurer of the Association, is a staunch believer in electrics and does his country touring in a machine that he has used for 8 years. With it he regularly makes the trip from Boston to Providence, 46 miles in 3 hours, whereas the average gasoline car making the trip does it in 2 hours and 30 minutes.

Improvements Necessary

Additional realism was added to the possibilities of cross-country touring by two electrics which recently made the trip from Washington to Philadelphia, and averaged 12 miles per hour for the entire distance. They do not recommend that people go touring in the ordinary electric vehicle as built today, as trouble will surely be encountered. The batteries are of not sufficient capacity, and other improvements are necessary in the vehicle.

J. M. Skinner, of the Philadelphia Storage Battery Co., believes that it is possible to use electrics for touring throughout all of the eastern United States, and corroborated his belief by citing that he has frequently made the trip from Washington to Boston without difficulty, averaging 50 miles per charge.

With the present charging facilities, there are only fifty charging depots on the line of the Lincoln Highway between New York and San Francisco, and of this number there are only fourteen west of the Mississippi River. With the present distribution it would be impossible for the tourist to even get from New York to Chicago, as there is one jump of 123.2 miles in Pennsylvania between Chambersburg and Greensburg, where there is not a charging station. This is the longest gap between New York and the Mississippi. West of the Mississippi there are but three stations between the Mississippi and the Missouri at Council Bluffs. There is not a single station between Omaha and Cheyenne, and from the time you leave Salt Lake City you do not meet with another charging station until you reach Sacramento, Cal.

Electric Taxicabs

An interesting part of the report was the fact that there are 600 electric taxicabs, or were before the start of the war, in Berlin, Germany. To keep these taxicabs supplied in batteries there are two battery maintenance systems in the city, one with 700 batteries, and the other with 450, the batteries having 250 ampere-hour capacity. These maintenance companies charge the operators 3 cents per kilometer for battery service, including minor repairs to the car, but not including washing and garaging. The chauffeurs receive as their compensation 25 per cent. of the fare, plus all tips. The expense of washing the cab is 25 cents, and one-half of this charge is taken out of the percentage earned by the drivers.

Changing the Batteries

The changing of batteries is handled as follows: The drivers are required to report at the maintenance depots at specified hours for changes of batteries, this practice distributing the load and reducing the number of employees in the depots. When the cab reports for a fresh battery the odometer reading is taken, and collection is made of the chauffeur or driver for the previous charge. When it is noted that a certain minimum mileage cannot be secured from a charge the taxi is required to go to the shop for overhauling. At the charging station the workmen are paid a premium when the battery life exceeds 10,000 kilometers.

The following are some interesting facts in connection with these system:

Number of taxicabs in Berlin	600
Taxi speed maximum miles per hour	20
Taxi income average per mile	$0.16
Battery capacity, at 5-hr. discharge rate, A. H.	250
Number of cells in battery	40
Life of battery plates, positive, miles	9,375
Life of battery plates, negative, miles	18,750
Time of battery change at depot, minutes	2.5

The prevailing conception that there are few electric vehicles in use in the different cities of Europe was fairly well exploded by P. D. Wagoner, of the General Vehicle Co., who has recently spent considerable time in Europe, investigating different aspects of the industry. Nearly every city in Europe has its quota of electrics. Thus Berlin in addition to its taxicab equipment has twenty-four electrically driven pieces of fire apparatus, thirty electric water carts for sprinkling the city streets, which are effecting a saving of $400 per vehicle per year over the previous horse system, sixty-seven electrics in the mail delivery service, etc. In Munich there are twelve three-wheel electrics used in the postal service, and Leipsig has twenty electric postal vans.

That the Electric Vehicle Association of America is not idle in its efforts to bring the electric vehicle before the attention of the postal authorities in Washington was well demonstrated in the report of the Committee on Parcel Post Delivery which was delivered by J. H. McGraw, who is Chairman of the Committee. This committee has been in touch with the Postal Departments, and has prepared a booklet entitled "The Electric Vehicle in Parcel Post Service for Economy and Reliability." Special letters together with a copy of this booklet have been sent to the President and his Cabinet, and to all members of the Senate and House of Representatives, to the Collectors of Custom of the principal parts of the country, to the postmasters in all cities of 10,000 population or over in the United States and Canada, and to all Departments of the Government, including army, navy, civil service, etc. The campaign was extended to Canada by having the Canadian Electrical Assn. take up the propaganda and spread it throughout the country.

In Parcel Post Work

The committee has gone further in developing the parcel post business in favor of electrics, and has secured detailed analyses undertaken by the Post Office Department to determine the parcel traffic in each of fifty of the principal cities for specific periods. The combined figures for these fifty cities, which have a total population of over 25,000,000, show that nearly 11,000,000 parcels were mailed out from these fifty post offices during the interval of October 1 to October 15, 1913, and 3,500,000 parcels were received at these fifty post offices for delivery during the same period. The average weight per parcel was 1 pound 11 ounces and the average parcel charge 10 cents. The cost of delivery by automobile was 5 cents per parcel.

Stimulating the Progress of the Electric Vehicle Industry

Inclination To Be Satisfied with Easily Secured Business Must Be Checked

James H. McGraw

TWO features of the problem which stand out boldly are the wealth of possibilities for large development, and the abundant resources among those engaged in the business. Yet in spite of great possibilities there is evidence of sterility in the comparatively little progress made. I say comparative progress judiciously, because I am not unmindful of the great number of vehicles already in service; but in view of what can be done and will be done, this is only a very limited beginning.

Three Reasons of Failure

If, therefore, we may be permitted to regard the present situation as unsatisfactory what are the causes? Aside from the generally depressed condition of business throughout the country, my investigations indicate that there are three reasons for the slow growth:

First, the novel character of the business, which, while it has brought large installations in the commercial field and successfully launched the passenger car, has been depended upon to carry the business to a point where exhaustion has set in.

Second, those responsible for the administrative conduct of the business have done little in a constructive or creative way to open up new lines of endeavor in exploiting their product, and have depended too much upon the routine performance of subordinates.

Third, defective collaboration from central station companies furnishing energy supply has not been received to the extent to which it must be exerted.

Taking up the first cause, we have a condition analogous to that which previously existed in nearly every other field of commercial endeavor where the introduction of new methods or of improved equipment became a problem. And in no case has substantial progress been accomplished until the impediments of novelty have been ruthlessly brushed aside by the stern and irresistible necessities of commercial enterprise.

This is the case with the electric vehicle. It has hardly reached a transitory stage. It is not yet commercialized. We are still fondling it as a luxury, hesitating to put behind it that dynamic energy necessary to force it upon the public which does not know its value and which is waiting to be convinced that it must have it and use it in great numbers as an economic necessity.

Considering the second cause, it must be evident to every keen observer that the solution of most of the many difficult problems now left to the salesmen must be made by those justly responsible for administrative functions. The inclination to drift with the tide of things, and be satisfied with business that can be readily secured, without any effort to sift out and win by sheer merit the more difficult but more profitable undertakings, must be checked.

The present semblance of weakness must be entirely changed, and upon the administration must be laid the task of discovering, testing and establishing those methods of organization and management by which all business productive energies may be united, stimulated, guided and rewarded.

A Great Opportunity

It is as much within the province of companies selling electrical energy to supply it for moving freight and merchandise as for other power applications, illumination, or passenger transportation. Yet the project has never been taken up seriously enough by them to realize the significance of its comparative value with the load now sought in their routine channels. The fact remains, however, that a great opportunity is passing by, practically unseen, except for a limited attention which is insignificant in comparison with what the prospect demands.

It requires but little observation to discover that the field has enormous scope. Every pound of material of any kind within the range of our vision in cities, excepting alone the original virgin soil and natural growths, has been moved at one time or another in some form of vehicle over the city streets. Every building has been carted in on wheels. All the vast equipment we make use of in any way whatever has been transported. In addition there is the enormous quantity of transitory merchandise, constituting our commerce, as well as our consumed materials; the sum total of which transportation might, and probably some day will, be performed electrically.

Some conception of this city vehicle load may be gained by reference to the volume of our transported materials in other directions. The annual tonnage originating on railroads for the past 8 years has averaged 800,000,000 tons. An equal amount was transferred to connecting railroads, thereby making the total annual rail tonnage over 1,500,000,000. It would be fair to assume that at least one-third of this finally reached our principal cities and was carted there at least twice over a distance of only one mile. We have a minimum of 1,000,000,000 ton-miles per annum. If the public service electric companies secure this business as completely as they have secured city rail passenger transportation and illumination, and it is practically within their reach, their profit would be enormous because there would be no such permanent investment or expense as is required in the present fields of their activity.

It is generally conceded that the freight tonnage reaching cities is handled many times over, but assuming as above that it was simply handled once from the railway to business premises and afterwards to the consumer, the above 1,000,000,000 ton-miles at an average energy consumption of 5 kilowatt-hours per ton-mile, would at the 4 cent rate reach a total figure of $200,000,000 per year, or nearly the present gross income of the central stations.

Now to consider the third cause. It may be well acknowledged that the attitude of the majority of central station organizations is favorable towards the advancement of electric vehicle projects, and that at least a half dozen of the larger ones are conducting organized departments for the advancement of vehicle use. Furthermore, all of them have liberally contributed to the funds of the general advertising campaign which has done such effective educational work in the past few years. However, it is equally plain that the central station effort is not at all in keeping with the enormous vehicle load which stands practically at its doors.

Millions in It

I have indicated in what direction the salvation of the industry lies. **We need to show the central stations of the country the great market offered by electric vehicles when they come into their own, and to induce them to preach their use in season and out of season as they do the use of lamps, motors and heating devices. Freight loads are larger than passenger loads and possess greater diversity. If, therefore, it is profitable to transport human beings electrically, how much more so would it be to transport freight; and if central stations are eager for railway loads, they should be even more keen to secure electric vehicle loads. I think they only need to be shown.**

European Development of the Electric Vehicle Industry

Discounting the War, Present Outlook for the Electric Abroad Is Very Bright

By P. D. Wagoner

As early as 1836, an American called Davenport of Brandon, Vt., built a model electric locomotive which was exhibited in London in 1837. In 1839 Robert Davidson, Aberdeen, Scotland, constructed a crude road machine that would move two persons along a rough floor. In 1840 Uriah Clark built at Leicester, Eng., a small storage battery weighing 60 pounds. Sir William Grove constructed his celebrated gas battery in 1842, and Gaston Platé began his researches in 1859, perfecting his battery 15 years later. Camille Faure took out his patent for material for the pasted plate in 1881, and in the same year Rafford of France brought out what Hasluck calls the first electrically driven road vehicle, followed by one G. Trouve 6 months later. The Ayrton (English) electric tricycle appeared in 1882. The first practical American Electric was probably the one built by Fred M. Kimball of Boston in 1888, and the first successful commercial electric, usually credited to Riker, materialized in 1897.

Rafford's electric (1881) was a tricycle driven by an electric motor of less than 1-8 horsepower, fed by twelve small Faure accumulator cells. The whole vehicle weighed 176 pounds. Ponchain's 6-passenger phaeton appeared in 1893 with a Dujardin battery weighing 1,100 pounds, over one-third as much as the entire vehicle. In 1896 Darracq exhibited at the Paris Salon du Cycle, a very interesting electric coupé.

There were developments in England and Germany about 1896 and the Jenatzy car and delivery car is mentioned in an English engineering paper in 1897. In 1899 Jenatzy won the kilometer record (mileage contest) in France with his torpedo shaped electric called "Jamais Contente." The De Dion Bouton people brought out a light electric in 1901, the accumulator consisting of forty-four cells of twenty-one plates and giving 200 ampere hours capacity.

The British Electromobile Co. developed an electric in 1902 and the Waverly Co., and the Vehicle Equipment Co. invaded England the following year with electric passenger cars. The Compagnie Francaise des Voitures Automobiles brought out a car early in 1900 which had forty-four cells of Faure-King accumulator, with a maximum speed of 11.1 miles per hour.

The gasoline-electric automobile carriage appeared in France as early as 1899 and in 1902 an alcohol-electric run by Krieger was entered in French tests. The car weighed 2,910 pounds, the forty-four cell battery 882 pounds, and the car had a speed of 9.32 miles per hour.

In 1898 there were contests between electrically propelled hackney carriages in France and electric cabs were relatively successful there from 1899 to 1902. The Opperman Co. (German) placed an electric van in the service of the London Post Office in 1901. American built commercial electrics were shipped abroad that year also.

Europe's Important Part

I mention the foregoing to illustrate that Europe had a very important part not only in the development of storage batteries, but of electric vehicles as well. But all this development practically stopped so far as the electric vehicle is concerned about 1903. The progress made from 1903 to 1909 appears to have been spasmodic.

I regret to say that I cannot tell you positively how many going concerns are manufacturing electric vehicles and batteries in Europe today, but the number of the former probably does not exceed eight or ten. There are a number of automobile manufacturers who build a few electrics in conjunction with their regular line.

There are today approximately 3,200 electric vehicles in the whole of Europe.

Electric Vehicles in Europe in the Spring of 1914

Country	Passenger	Trucks	3-Wheelers	Postal Cars	Total
Germany	862	554	3	270	1,689
Holland	70	38	1	6	115
Denmark	2	21	..	5	28
Sweden	2	2	..	2	6
Austria-Hungary	132	117	1	15	265
Belgium	1	..	..	..	1
France	100	190	..	28	318
Russia	3	4	..	1	8
England	201	62	..	25	288
Switzerland	131	69	..	..	200
Roumania	..	..	..	1	1
Spain	12	..	..	1	13
Italy	60	173	..	5	238
Total	1,576	1,230	5	359	3,170

Probably 25 per cent. of the electric passenger cars in England are of American manufacture and possibly 10 per cent. of those in France. The number of commercial electrics exported to Europe is to date almost negligible.

The number of electric trucks in Europe is very small. The development has been along highly specialized lines; taxicabs, municipal apparatus and postal vehicles predominating, with a few score buses, public utility and mine working vehicles scattered through various countries. Few of the passenger electrics compare with our luxurious cars and many of the mail wagons are of the frail light weight, inexpensive tricycle type. Electric vans for wholesale dry goods, grocery and general heavy delivery service are used to only a very small extent in England and parts of Germany and France, and fleets of from twenty-five to fifty 5-ton or even 2-ton trucks are unknown.

Cabs in Berlin

Motor cabs first made their appearance in Berlin in 1900. Early in 1914 there were 3,090 horse cabs, 1,946 petrol cabs and 386 electric cabs in use in the city of Berlin.

A very interesting phase of the taxicab situation in German cities is the demand made by the police authorities that for every motor cab placed in service, one if not two or more horse cabs must be retired. In Breslau and Bremen, two cities having an unduly large number of horse cabs, five and four horse cabs respectively are removed for each motor cab licensed.

In some cities no motor cabs are allowed to start operation beyond a certain predetermined number, with the result that some hack drivers in Berlin have sold their permits to motor cab operators for 2,000 marks (about $475). In Munich the motor cab operator must show 100 marks operating capital and pay 3,000 marks to displace a horse cab operator who has been in business five years.

The Allegemeine Berliner Droschken Gesellschaft operates 200 taxicabs. They have several charging stations and 400 batteries. The battery is placed under the driver's seat. Batteries are changed in about 2 minutes by means of hydraulic lift. When fully charged these electrics make from 50 to 60 miles and some of the cabs can be speeded up to 22 miles per hour. Other taxicab companies operate smaller fleets in Berlin and other German cities.

Higher Speed Made

Electric trucks and delivery vans have a higher rated speed in Germany than vehicles of the same capacity in this country. One-half and 1-ton vans often have a speed of from 15 to 18 miles and at more moderate speeds give as high as 62 miles per charge, while 5-ton vehicles at 7 1-2 to 9 miles per hour give from 37 to 44 miles per charge.

Bakers and dry goods firms are beginning to use the electric in Germany and a few electric vans have been placed in storage warehouse work. Electric water carts are very largely employed, about thirty being used in Berlin alone. These carts water about 49,000 square yards of pavement per day of 8 hours against 30,000 square yards for horse apparatus. The saving of the electrics over horses is about $400 per electric car per year.

The Berlin Fire Brigade was using twenty-four electrically driven vehicles in March of this year. Electric dust carts are extensively used in Hamburg and Altona. Electric tractors are attached to water carts, slop vans, snow carts, street sweepers, etc., in some German cities. The Great Berlin Tramways use several unique electric tower wagons or break-down cars. The tower is placed on a 3-ton chassis and is removable.

In Mail Service

Berlin has sixty-seven electric vehicles in mail service. Nineteen of these are of the tricycle type, 500 pounds capacity; thirteen of the same type are of 900 pounds capacity; the remaining thirty-five are four-wheel vehicles of 3,700 pounds capacity.

Munich has twelve light three-wheel vehicles in postal service and Leipsig twenty-six electric postal vans of 3,500 pounds capacity. The latter are used principally in parcels post service though some move mail in bulk.

On March 1, 1912, the Vienna postoffice approved an experimental electric for

(*Continued on page* 782)

To Develop South American Trade

Establishment of Dollar Exchange and Perfection of Our Selling Machinery Recommended by Latin-American Trade Committee—Financial Assistance Needed by South America

ACCORDING to the Latin-American Trade Committee appointed by the Hon. W. C. Redfield, Secretary of Commerce of the United States, the best methods to remedy the present disorganization of our trade with Latin-America and to place it on a permanently satisfactory basis are the following:

1—The establishment of a dollar exchange, *a*—By the ultimate creation of a discount market; *b*—Pending the establishment of such for the extension of credit by the banks, an establishment of reciprocal balances in the United States and in Latin-America for financing trade.

2—Perfection of our selling machinery, *a*—By furnishing additional support to commission houses already familiar with Latin-American business; *b*—By forming associations of merchants and manufacturers to be jointly represented in Latin-America; *c*—By obtaining information as to the possibilities of developing retail stores in large Latin-American cities.

Extracts from the report and recommendations of the committee fellow:

An Opportunity

"An opportunity is now afforded to place the trade of the United States with other American nations upon a firm foundation, supporting a more comprehensive structure which may be built as the situation again more nearly approaches normal.

"The Committee feels, however, that there is great danger that our merchants and manufacturers unfamiliar with Latin-American conditions may be induced by recent publicity to undertake ventures in that field which not only will be unremunerative but actually disastrous, and, in their ultimate result, make for a reaction of the very healthy and much to be desired interest in foreign trade now manifest throughout the United States, an interest which, if properly directed, should be of great permanent value.

"The trade of the principal South American countries with England, Germany and the United States is shown by the accompanying table.

Our Exports Concentrated

"Our export trade to South American countries particularly, and to a lesser degree the Central American States, is concentrated. It is estimated that 75 per cent. of our principal exports to South America are the products of large organizations. Our principal exports to the River Plate may be roughly stated to consist of agricultural machinery and allied products, steel products, oil products—kerosene, gasoline, etc.—and printing paper of various kinds. Our exports to Brazil, Chile and Peru are largely limited to steel and oil products, locomotives and electrical machinery. Our trade in cotton cloths, shoes, stockings wearing apparel, and miscellaneous goods, has not made up an important part of the total because of our unwillingness or inability to meet British and German competition.

Our Imports Increase

"Even before the war our export trade to all Latin-America, and notably South America, had begun to decrease on account of the prevailing financial stringency. Our imports, however, increased in value, and the trade balance adverse to the United States for the fiscal year 1913-14 greatly exceeded that of 1912-13, both for all Latin-America and for South America alone.

"Since August 1 of this year the countries in South America whose currency is not already on a gold basis have experienced a serious depreciation of their paper money.

"The export of copper, tin, nitrates, coffee and other products has been curtailed because of loss of the normal European markets. As indicative of financial conditions, bank holidays and moratoria were declared at the outbreak of hostilities which were extended in certain countries from 60 to 90 days. The effect has been damaging to American exporters as, under such circumstances, drafts due in August will not be liquidated until November or December. This means a large accumulation of draft indebtedness never contemplated by the shipper. Specie payments were suspended.

"Collections throughout South America, therefore, are difficult, orders are falling off, and after our exporters have completed their contracts for this year, there seems less prospect for new business unless steps are taken to relieve the situation.

"Since the balance of our trade with South America is heavily against the United States, there should be exchange facilities which would enable our exporters to obtain payment from balances created in New York in settlement for goods imported into this country from South America. Such balances, however, are not maintained in this country.

"The external debt of the South American Republics (Federal, State and Municipal), amounts approximately to $1,632,488,580. The bulk of those funds were borrowed from Great Britain. South America therefore invariably has payments to make in London.

Britain's Supremacy

"The greater part of South American banking business, moreover, is conducted by British owned institutions. These facts, together with the facilities offered by the London discount markets, have induced German and other European owned banks trading in South America to maintain London agencies. Sterling credits, therefore, have been the basis of South American trade.

"Our exports to, and imports from, Latin-America are shipped direct. They are, however, (almost exclusively in South American trade, and largely in Central American trade) paid for in sterling bills of exchange.

"United States exporters have, in the past, converted their dollars into sterling at the rate of the day, drawing against their South American customers at 90 days' sight, payable in 90 days' bills on London. Importers have accepted 90 days' sterling bills, which they have liquidate at the current rate of exchange.

"Thus, although the balance of the South American trade of the United States has been increasingly heavy against this country, we do not make settlement direct. We have been obliged, either by the shipment of gold or goods, to settle this adverse balance by remitting to England either gold or goods, to meet interest charges on the South American debt, and to pay for goods purchased in Europe by the South American countries.

Present Problems

"Production in the United States can be maintained if there be a sufficient market at home and abroad for American goods. Production in South America

may continue but cannot be further developed unless financial assistance be obtained.

"At the present time steamships are available and sailing regularly from this country to the principal ports of Latin-America and from those ports to the United States. Many of these vessels are unable to obtain full cargoes. Although only a limited number are under the United States flag the above will clearly indicate to exporters, importers and manufacturers that they need not hold back from entering the field on this account.

"Before trade can resume its normal course, the exchange problem must be solved, either by the restoration of old, or by establishment of new, credit facilities.

New Credit Machinery

"Old methods may no longer be serviceable in the situation which will result from the readjustment following the war. It should now be possible indeed, in the mutual interest of the Latin-American Republics and ourselves, to create new credit machinery to perform the functions of the old, and which will at the same time rid us, at least partially, of a dependence upon the London credits and European financial markets which, though essential in the past, has proved to be seriously embarrassing.

"It has been increasingly the practice of European bankers to stipulate the use of European material in the projects which they financed. Latin-America is now turning to the United States for funds. This country is hardly in a position to undertake considerable investments at the present time, **but industries with an already considerable trade at stake may well consider the necessity of protecting that trade by obtaining for their customers some relief from the present stringency. Such investments, if judiciously made, would yield an ultimate fair return and meanwhile provide a market for American materials which cannot now be sold.**

A Security Market

"The question of creating a market for Latin-American securities in the United States, therefore, is highly important. The development of our trade with those countries is largely dependent on its satisfactory solution.

"Unless the restriction of commercial credits be remedied, however, we will not only be unable to extend our trade but we will lose a considerable portion of that which we already have.

"The present effort to secure co-operation of American bankers in massing a gold fund to satisfy our obligations abroad by promising to cause London exchange again to approach normal, will lessen to the American importer the expense of liquidating in London his South American indebtedness. It will nevertheless give effect to the old alienation of the selling power we should derive from purchases of South American products. Liquidation of our South American indebtedness in London will pay for British exports to Latin-America, at a time when American merchandise, intimidated by moratoria, remains congested on our docks. Our available money will serve Great Britain's effort to capture South American markets vacated, perforce by Germany.

"Whenever there is a great disturbance of the world's finances, American exporters and importers in South American trade are injured, because of their dependence on London. **This has happened four times in 25 years.**

"So long as South America must meet interest settlements in London by shipment of goods to the United States, under the old three-cornered system, our South American trade must, to a certain degree, depend upon London exchange.

Independence Needed

"But in view of the facts above mentioned, it has seemed to your Committee that the need for independence, emphasized by the present situation, should be recognized. We feel that an attempt should now be made to evolve some plan whereby we might take advantage of our large direct trade with Latin-America to make a market for bills drawn in dollars, and establish a direct exchange, not with the view to eliminating sterling credits now or later, but in order to provide an exchange channel which will supplement, offset or compete with London, and be available in an emergency when London exchange is disorganized.

Co-operative Exchange Proposed

"A plan for the establishment of a Merchants' 'Co-operative Exchange,' or clearing house for Latin-American trade, has been proposed. This, it has been suggested, would enable importers and exporters of goods to and from Latin-America to watch credits, balances to be remitted on definite settling dates.

"The Committee, however, after careful consideration, feels that the suggested "co-operative exchange" would not be practical, although a powerful banking group or large banking institution willing to assist in maintaining and developing our Latin-American trade might be able to secure and render mutually beneficial the organized co-operation of exporters and importers in matching credits.

'The Committee, however, believes that the extension of credits might be facilitated and some relief afforded, pending the establishment of the Federal Reserve Banks, if, in addition to permitting national banks, which have signified their intention to enter the Reserve Associations, to accept commercial paper, action be taken by the Federal Reserve Board to make immediately effective the rediscount provision of the new banking system, thus assuring early establishment of a discount market.

Extension of Trade

"The question of extending American commerce with Latin-America depends primarily, as does the problem of maintaining our trade, upon the establishment of commercial credits, upon our ability to finance Latin-American enterprise, purchase the products of its soil and industries and upon the perfection of our selling machinery.

"Your Committee feels, however, that merchants and manufacturers now contemplating an entry into the Latin-American field should be careful to avail themselves of the easily accessible information concerning these markets. It is suggested that they should, at the outset, remember that the cost of maintaining individual representatives would probably be too great for any one of them to bear themselves. It is therefore suggested that associations consisting of the smaller firms or corporations engaged in kindred lines of production might be formed, and that either one or more representatives should be sent to South America to look after the interests of such associations, thereby bringing the cost of representation within a reasonable limit."

Trade of Principal South American Countries With England, Germany and the United States

Country	Year	England		Germany		United States	
		Imports	Exports	Imports	Exports	Imports	Exports
Argentina	1913	$126,305,556	$116,154,937	$68,815,721	$55,888,788	$59,861,703	$22,096,385
Brazil	1912	77,509,079	43,006,473	52,945,352	51,856,965	48,043,322	141,720,216
Chile	1912	38,599,282	55,340,706	33,189,070	28,321,776	16,806,341	24,526,811
Peru	1913	7,779,616	16,561,235	5,138,902	2,970,857	8,541,934	14,761,355
Ecuador	1911	2,835,854	986,148	2,385,758	2,139,552	2,591,629	3,190,069
Uruguay	1912	*12,575,508	6,508,127	*7,849,094	7,860,272	*5,638,402	2,655,371
Paraguay	1912	†1,295,248	‡799	†1,500,958	†843,459	†304,888	†590
Colombia	1912	†7,838,878	†4,376,182	†4,201,125	†1,854,211	†7,612,037	†15,832,882
Venezuela	1913	3,994,733	767,031	2,586,986	5,563,768	6,944,136	8,470,563
Bolivia	1912	3,528,042	26,044,974	6,423,802	4,357,101	1,787,321	152,583

*Figures are for 1911 and are taken from the Almanach de Gotha.
†Figures are taken from U. S. Daily Consular and Trade Reports.
‡Figures are for 1911 and are taken from Pan American Union publication.

Autumn Painting and Varnishing of the Car

Protecting the Surface During the Autumn and Winter Months a Matter of Economy

By M. C. Hillick

PAINTS and colors on the automobile wear in proportion to the measure of protection afforded them by the varnish. At this season of the year, after the brunt of the summer campaign is well over, the average car surface is in urgent need of the additional protection which a coat or two of varnish applied at this time or during the next few weeks, will afford.

Saving Repainting

A great many car owners have come to appreciate the importance of varnishing, and, if necessary, of both painting and varnishing, the car during the middle or late autumn. Sometimes a coat of color and a coat or two of varnish applied in the autumn will save a lot of thoroughgoing painting repairs which otherwise might be necessary a few months later. **It is of the utmost importance that the exceedingly sensitive and delicate color coats be kept amply protected by varnish.**

Even car owners, usually indifferent to the actual paint and varnish needs, have in these later years learned to respect the value of maintaining plenty of varnish protection on the automobile. These men, fortunately, have recognized, and are more and more recognizing, that not alone the color coats but the pigments united into a foundation for the support of these colors need the protection which only a strong body of varnish can give.

Autumn Finish Needed

It is due to them, and to the information which they are prepared to give their fellow car owners that a more general autumn painting and varnishing of the automobile is now regularly being done. It is all a very real matter of economy. The surface of varnish that has been, during the summer months, cleaned, renovated and polished, until it would fairly seem stripped of all its substance, has very little left with which to protect and give life to the color coats, and, incidentally, to the coats protecting them.

The cleaning and polishing materials now so extensively employed upon car surfaces have a decided erosive effect. This erosion systematically practiced for a few months will, upon examination, be found to leave a very thin film of varnish to protect the undercoats.

Some Polishes Injurious

A recent examination of a number of different makes of cars which for a period of from 4 to 5 months have been regularly cleaned with patent renovators and polishes discloses the fact that in all cases the varnish has been worn practically threadbare, and in some, the finish has virtually disappeared, leaving the delicate fabric of the color entirely exposed.

Continued examinations of this character would doubtless disclose at this time an amazing percentage of car surfaces with the finish worn until it is no longer capable of serving as a protector of the painting.

Revarnish Every 6 Months

It has been demonstrated over and over again within the past few years that maintaining a strong and ample body of varnish on the car represents the very highest economy.

It has also been proved by numerous tests conducted by automobile painters that the average finish on the car exposed to daily road service needs replenishing at the expiration of 4 or 5, and at the longest, 6 months. To carry the finish along beyond that time without at least a coat or two of varnish, as local needs and conditions may suggest is to trifle with a matter of expense running up close to, and often reaching, three figures.

When the finish is found to have been worn through to the color, with this color materially affected by contact with direct sunlight, the weather, city gases, and other deleterious substances, a fresh application of varnish will not suffice to restore the surface to its original condition. More thoroughgoing measures are needed.

It would be a good plan for every car owner, or everyone invested with authority, to keep it in condition to examine the finish on the car carefully, in order to know personally about what the requirements are at this season of the year. In the main, the ultimate decision as to what the finish precisely needs should be left with the painter. The list of requirements at this time of the year runs, usually, from a simple revarnishing with one coat of varnish to the application of two coats of varnish, one rubbing and one finishing, and from that to a coat of color and two coats of varnish, and finally to thorough repainting throughout. As a rule, however, this latter class of repairs can be deferred until spring by the application of color and a couple of coats of varnish.

Varnish Indispensable

Under no circumstances should the finish, when showing visible signs of wear and tear, be left to get through the winter without the additional protection afforded by at least one full coat of varnish. The cases where a coat of rubbing, and over this a coat of finishing is necessary are provided by surfaces which show a dry and parched condition with more or less fine checks traced here and there through the varnish. The surface showing this condition will first need rubbing down with water and pulverized pumice stone. This process will break down the worn and harsh texture of the finish, cut away the dirt specks, grease, and foreign substances, and in a general way, put the surface in a receptive shape for the varnish coats.

Touching Up Spots

Following this rubbing process the surface should be carefully washed in clean water, and if marred or disfigured in any part, such places should be touched up with fresh color, matched to the existing field color. Making this match color is really one of the most important processes of all. A good eye for color, and experience in working in colors is required. Much depends upon touching up these bruised spots. This should be done with a small pencil brush, and the color should be confined exactly to the bruise. The expert colorist lays much store by this process, and he invariably mixes the color with enough

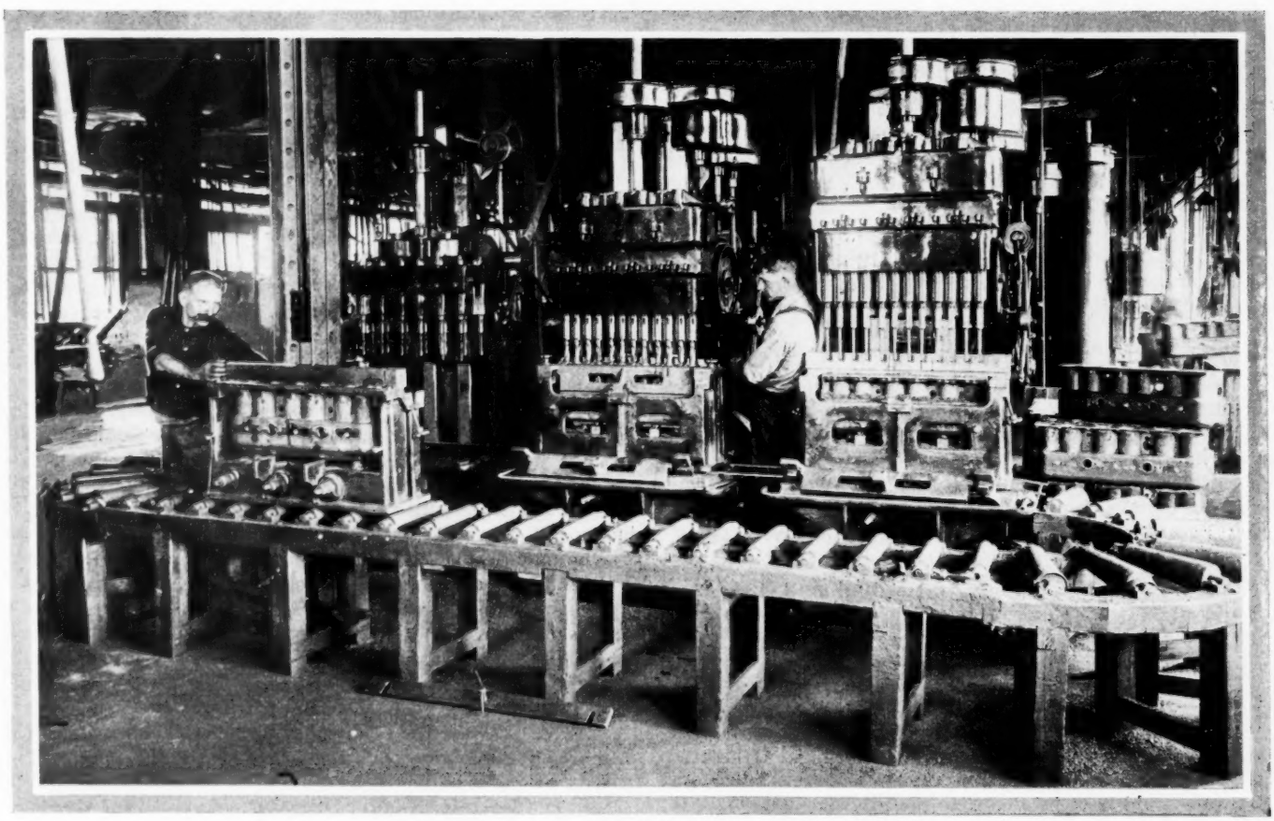
varnish to cause the mixture to dry with a decided gloss, thus excluding the light from the pigment and causing it, when dry, to retain the same tone and shade displayed when mixed for application in the container.

Sealing Up the Checks

When the touch-up color has dried on the surface thoroughly, apply the coat of rubbing varnish. A considerable percentage of this coat will be taken in by the old finish, this absorption serving to seal up the fine checks and the weather beaten fabric of the old finish. Let this coat dry hard and firm, and then rub it down uniformly with water and pumice stone flour, after which wash and clean up thoroughly, and apply one coat of finishing varnish. The finish now presents its royal self once more, and is prepared, with a reasonable degree of care, to stand up strong and intact through the rigors, and the generally hard conditions, of winter service.

If the surface is in such shape that the rubbing coat of varnish is not necessary, a light rubbing with water and pumice stone will only be needed to make it fit to receive the finishing varnish. Touching the surface disfigurements, as above advised, with color will, of course, rank as one of the needed processes. In a general estimate, it may be said that the finish on very few cars which have been used throughout the past season is in a condition to undergo, without a fresh supply of varnish, the rigors of winter service.

Studebaker Machines Cylinders à la Merry-Go-Round and Saves Both Time and Labor



The extent to which the quantity production of high-grade motor car parts has been developed is often illustrated by specially-built machinery and equipment, but it is doubtful if a better illustration of this specialization can be found than the arrangement used by the Studebaker Corp. in its cylinder machining department. In drilling the stud holes, and in drilling and reaming the valve stem guide holes and push rod guide holes in a six-cylinder block casting only 15 minutes are consumed. There is no lost motion, though the blocks of cylinders are not light to handle by any means. One hundred blocks are handled a day by this crew of two men.

The three multiple-spindle machines are arranged in line so that the operator can manage all three at one time. The loader simply places the block of cylinders in the big jig and then pushes it around on the rollers to the first machine, the level of the roller conveyor being even with that of the table of the machine so that it is an easy matter to slide the casting in its jig onto the machine. Then the operator sets the drill in motion, drilling the thirteen stud holes at one time.

This finished, the operator pushes the jig over onto the table of the adjacent machine for drilling the valve stem and push rod guide holes, there being twelve of these. The casting finally progresses to the third machine where the last holes drilled are reamed out. The jig and casting are then shoved back onto the rollers, the jig removed and the casting picked up by a monorail conveyor which carries it to another machine for further work The heavy jig is then rolled around on the circular track to the loading point, when, after reloading, it goes again to the first drill.

There are several jigs so that there is no wait between loading and machining, the loader always having a new block casting ready for the first machine. This merry-go-round method saves the services of at least one more man, and perhaps two if the greater daily production which it makes possible is taken into account.

Thinks 12-Volt Electrical Systems Are More Efficient

The Automobile Engineers' Forum

Finds 6-Volt Types Satisfactory in Principle and Operation, but Considers 12-Volt Ultimate Favorite—Reader Points Out That All Standards Change—Opinions Differ on Economy of Using Oversize Tires

EDITOR THE AUTOMOBILE:—In our opinion, the 12-volt starting and lighting systems will ultimately be preferred by manufacturers of motor cars for the following reasons:

1—It is possible to use smaller wires and these are both less expensive and less difficult to handle.

2—Starting motors and lighting generators can be made lighter with the same efficiency or, if made to have the same weight, can be designed for higher efficiency.

3—If a single cell becomes ineffective because of a short circuit or broken jar, only 16 2-3 per cent. of the battery voltage is lost instead of 33 1-3 per cent., as would be the case with a 6-volt system.

4—The drop in voltage caused by the momentary heavy load of cranking the engine, does not result in as great a loss of efficiency in the motor nor is the drop as great in percentage in the individual cell.

Six-Volt Systems Are Good

We do not think that present-day 6-volt systems are in any way unsatisfactory either in principle or in operation, but feel that the 12-volt design is a part of the natural evolution toward improved efficiency.

We are convinced that just as strong and just as efficient lamps can be made with 12-volt filaments, once the manufacturers turn their attention to this problem.—WILLIAM S. GOULD, vice-president, Gould Storage Battery Co.

Takes Exception to Pneumatic Ideal Car Ideas

NEW YORK CITY—Editor THE AUTOMOBILE:—Willis A. Swan is interesting, without doubt an enthusiast, and that is in this dry age exceedingly refreshing. Unfortunately, automobiles are not built by enthusiasts, otherwise Mr. Swan would have by this time the pleasure of seeing his dream realized. I reread the epistle on two-stroke cycle engines on page 486 of THE AUTOMOBILE for September 10, written by a woman. At least, it speaks there contemptuously of "mere man." "Show me your friends, and I will tell you who you are." Since that epistle is of the broader scope I will answer that first with as much seriousness as is within my command.

The Changing Conditions

Alas, you dreamer, "the light of knowledge" is a very frail thing of but short existence. Where are the altars erected by those gone before us? Pilate, the governor of the conquered province of what we now call Palestine called out, "What is truth?" It is like knowledge, an intangible, ever-changing phantom. As we are holding the knowledge of those of former days lightly; so will our day's knowledge be held in contempt some future day.

Even in mechanics we cannot establish a truth, for evermore this no one knows better than those who trod the unbeaten path, the "inventors." I hear Mr. Swan cry out that 2×2 makes 4 and forever will be, and that, therefore he has stated a truth which knows no time. My dear Mr. Swan, you have then stated that red was red, or green green. An accepted term of human intercourse is not Truth. A Truth is susceptible to interpretation and is therefore flexible. The same must be said about Knowledge; that, too, is like a river flowing. But see what you say:

Likes to Hear Motor

To quote: "The low volumetric efficiency and the fuel extravagance of the two-cycle are the results of poor design and poorer inventive ability." And later on: "Efficiency greater than that of the Diesel engine." H. A. B. does not seem to know that the Diesel engine is built in four-cycle as well as two-cycle; the statement therefore is not logical. When H. A. B. complains fuel extravagance then he or she is equally limping: What the comparison? The four-cycle engine? Are there not two-cycle engines showing as good an exhaust as four-cycle engines? that so, there would be no extravagance. Maybe, too much is expected from the two-cycle engine; everything has its limitations. To quote again: "Silence made absolute." There is no difficulty at all in producing a silent engine. Any good designer will take an order to eliminate what little noise there is left; but, dreamer that you are, you have not as yet experienced the pleasure of perceiving the music there lies in a motor which can be heard. But not alone that an experienced operator knows the need of an engine not silent, he learns to understand its language and in so doing the two become friends. Should the engine become distressed, its friend the operator will at once perceive the need of the helping hand and will apply himself in the right direction. But the grand finale: IT CAN BE DONE; IT HAS BEEN DONE.

Now, my dear Mr. Swan, do not conclude because I do not answer fully that what you have said is unanswerable. I have no wish to be rude, I have to keep in mind that space is limited and that the blue pencil of the editor is—well, is but a blue pencil.

Standards Ever Changing

Look backwards: Where are the standards of yesteryear? Do not be deceived because your horizon is small, that is no evidence that the world is no larger than you can perceive it.

All life is a never-ceasing battle; there are a great many standards in various fields of human endeavor that are this moment defending themselves against the onslaught of change or, as some call it, improvement. Our standards are but our momentary resting places; sitting-places, very necessary to keep our strength. They are after all but a link in the chain of events. Absolute standardization means abolishment of inventor and designer alike, and still you admire

H. A. B., who bids both to bestir themselves and produce?

Mr. Swan, you are happy to report that your Wheeling friends are able to produce alcohol so cheaply; but come now; think what would be the case if the U. S. government had standardized the methods of producing alcohol. What supreme master is to sit in judgment to say when the standard is reached?

Nevertheless, you will do the government a service if you will call attention to the misinformation they are handing out, whatever their intention. As to patent No. 692,218, I am sorry to say I am unable at this writing to consider it; I will hasten, however, to send for a copy of this patent, although the weight given is nothing worth mentioning, over 7 pounds per horsepower; when some engines of the first class weigh about 2 1-2 pounds per horsepower, and four-cycle engines, too.

Sees Difficulties in Operation

To quote you: "How simple. All we have to do is to run our present motor at a constant speed, at which it operates most economically." But, since you are unwilling to use gears and clutches, you will have to gear, pardon me, connect your motor to your axle, so that you run at about 3 miles per hour; many times, running between other vehicles, you must maintain that speed for long stretches; but would that not be rather slow? Connect at 20 miles per hour you say. Quite so, but then how are you going to slow down? Meanwhile you forget that your engine is running at about 2,000 revolutions per minute; to have an engine right on the axle under those conditions you will have to use rather small driving wheels, would you not, say of about the size of a spool of cotton thread? Maybe I am all wrong and those are little details you leave to the designers.

When saying that the internal gear is for the horsepower transmitted the most efficient of all; then I admit I have great difficulty in following you; do you measure efficiency in a gear by the surfaces engaged? The rolling friction is the least, you grant that? The rubbing friction the greater; now just study a common spur gear and you will find that if the teeth were but formed heart shape there would be an almost ideal rolling friction; now such gears are made for clocks and the like only, for the reason that at their bottoms they have no strength; the ordinary tooth of a gear is a compromise (as everything else in engineering if you but realized it). Now try an internal gear and you will find an amount of rubbing friction that makes that style useless for most purposes: For example, a certain chain hoist had such an internal gear, but the same people who made that hoist, instead of using but two gears as that hoist had, use now common spur gears and, if I remember correctly, five of them. Why, pray?

And air motors can be had at 5 pounds per horsepower! But an air motor cannot produce power. A gasoline engine is complete, but look at the air motor: You must have an air compressor to operate it that weighs how much? Five pounds per horsepower? That makes now 10 pounds per horsepower. You must have an engine to operate the air compressor that weighs 5 pounds per horsepower? That makes 15 pounds per horsepower. Things are getting rather heavy, are they not?

Carbureter Not Always Used

But, just think: Why not use the engine in the first place to drive the car? Ah, maybe I am a little dull. You are going to use that combination in lieu of gears. But, I am trembling with emotion! Common gears as now used are far more efficient than that, less costly and more reliable.

The three engines finally mentioned I confess I am well familiar with, but pardon me for differing with you; the Diesel engine is sure enough a type. By Hornsby you probably mean a type of engine built by the Hornsby-Akroyd people of England. I know of the Secor engine, but I have never heard anyone referring to that engine as a type. Nor are they the only people who do not use a carbureter.—B. H. BRITT.

Oversize Tires Economical for Both City and Country

NEW YORK CITY—Editor THE AUTOMOBILE:—In the majority of instances, the car manufacturer in selecting his tire equipment, merely takes into consideration the weight of the car when leaving his factory, regardless of what the actual weight of the car may be when it ultimately is delivered to the consumer and put into service by him.

For Overhead Work

What we particularly refer to is the added weight from extra equipment such as gas tanks, trunks, extra tires or even carrying more passengers than the intended capacity of the car. For this purpose tire manufacturers have constructed an oversize tire, which increases the outside diameter of the tire 1 inch and the cross-section diameter 1-2 inch—in this way making it possible to use a larger casing without necessitating any change in the wheel size. The enlarging of the tire takes care of the additional weight, preventing overloading of the tire equipment.

Oversize Increases Comfort

In addition to this, owing to the increased inner or tube surface of the casing, owing to the larger cross-section diameter of the tire, the car will consequently ride with considerably more resiliency, increasing the comfort of driving.

Oversize tires are constructed in such a way so as to properly fit the same rim as is built for the smaller tire, and if the tire is properly seated on the rim and kept properly inflated, there should be no side rolling movement.

It is just as advantageous to the city motorist to use oversize tires as to the country driver. Aside from the advantages of easy riding, this naturally will lessen the possibility of bruising the tires or injuring the carcass from riding over car rails and holes or unevenness in pavement, thereby greatly increasing the service obtained from the tires.

Although the initial expense of adopting the oversize casings may, at first, seem to be greater than would warrant the change, the fact of so many automobile owners adopting these larger size tires and the resultant additional service they get from them is, in itself, proof-evident that it must be to the owner's interest to make such a change.—AJAX-GRIEB RUBBER CO.

Thinks Use of Oversize Tires Is Seldom Necessary

NEW YORK CITY—Editor THE AUTOMOBILE:—We feel that the matter of oversize tires is often overdone.

The majority of the cars that are put on the market come out of the factory equipped with the minimum sized tire that the factory could equip the cars with for ordinary running purposes, but, as is generally the case, people use cars for touring over roads that put the tires to a rather severe test. Therefore, as a general rule, we would advocate oversized tires up to a casing of 5 inches cross-section, but when it comes to putting a 5 1-2-inch as an oversize on a 5-inch tire, we think the additional expense is out of proportion to the actual running service that they render unless it is a car that is being used under extremely hard circumstances and carrying a load of over 6,200 pounds.—COLUMB TYRES IMPORT CO.

The Rostrum

Suggests Hydraulic Clutch for Smooth Starting

EDITOR THE AUTOMOBILE:—Automobile operators use a low gear to get under way and high or direct for driving. This changing requires an undue amount of attention and labor which could be avoided.

The usual friction clutches do not allow slipping to any great extent such as would be necessary to get started on high gear ratio in the first place, but why be content with that?

Some 20 years ago a number of fluid clutches were designed to work in conjunction with electric motors on street cars. The present so-called series-parallel system of control device soon appeared and took its place.

Why not use fluid clutches in our automobiles? If this were done, the gearshift for starting purposes would be avoided and the cost of such a clutch is not prohibitive by any means.

A fluid clutch is not a positive hydraulic transmission device; whatever slipping takes place is lost power but the great convenience derived by its use makes up for it.

In simple form it is merely a rotary pump mounted upon the crankshaft of the engine, the rotor is keyed to the crankshaft and the housing to the shaft of the change-gear box. The pump is full of oil and the discharge is connected to the inlet with a valve in circuit. If this valve be wide open then the clutch is out and the oil will circulate continually. When the valve is entirely closed the oil, unable to leave the discharge, locks the rotor and the mechanism rotates as a whole. If the valve be partially open, the oil flow will find resistance at the valve and will in proportion to this resistance have a turning effort on the housing which is mounted upon the gearbox shaft—the greater the resistance to such oil flow, the greater the turning effort, that is, to speed up, one closes the valve and the car will get under way in proportion to the time used to close the valve. Simple, is it not?

Gearbox Also Required

It does *not* replace the gearbox although it permits the motor to run at maximum speed and the car at any speed, a mere creeping even. At full speed, like a planetary gear the mechanism moves almost as a unit, but not entirely so. There will be some leakage within the mechanism. At all other speeds the power represented in the difference of speed between car and motor is a total loss.

A fluid clutch heats, and that in proportion to the slippage. For this reason as great a radiating surface as possible is provided. It is likely that trucks would need to use a fan to keep the fluid clutch from overheating. Fluid clutches are filled with a heavy oil, and when hot this oil becomes as thin as water so that a definite notch in a quadrant cannot be used to set the control lever by. According to the degree of thickness or thinness of the oil the control lever requires to be set more open or more closed.

For very heavy work like gas-locomotives, which have great trouble to keep their clutches in order, a positive clutch must be employed in addition to the fluid clutch, so that the ultimate working strain will not be borne by the fluid clutch.

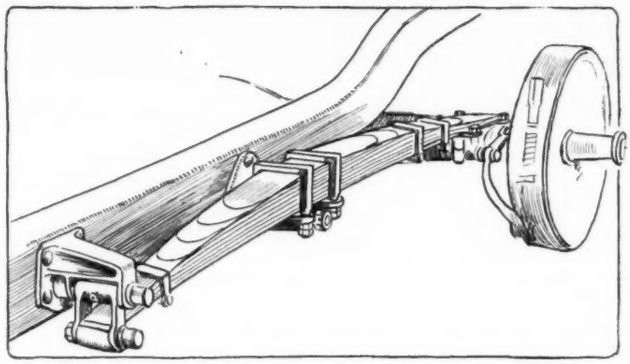


Fig. 1—Cantilever spring construction showing attachment to frame and axle

The life of a fluid clutch is much greater than a friction clutch, it will stand more abuse, since a car is brought up to speed more gradually by its use.

The fluid clutch offers a peculiar advantage in that it may be easily arranged to prevent the stalling of an engine, the clutch opening up automatically when engine drops below a given speed.

New York City. P. G. TISINER.

Wants to Install Cantilevers

Editor THE AUTOMOBILE:—I have been figuring on changing the rear springs on my car from platform to cantilever. If it is possible will you please show me by drawing how this is done, particularly how the spring is fastened to the rear axle, also whether or not it will be necessary to have radius rods.

New Albany, Ind. LEE E. SMITH.

—The cantilever may be used with or without radius rods. It is ordinarily fastened to the axle at the rear, pivoted at the center and shackled to the frame at the forward end, as shown in Fig. 1.

It is inadvisable to change your spring suspension as with your lack of knowledge of the subject you will decrease rather than increase the riding qualities of your car.

Six-Cylinder Two-Cycle Gives Smooth Torque

Editor THE AUTOMOBILE:—Since the gasoline motor does not begin to produce much turning effort of the crankshaft until 15 degrees after top dead center and produces its greatest turning effort at about 60 degrees, would not a six-cylinder two-stroke cycle so timed that when one cylinder was producing its greatest turning effort the next cylinder would fire, and at 15 degrees thereafter, would not this second explosion increase in turning effort as fast as the previous explosion increased?

2—If not, how many cylinders would be required?

3—To reduce vibration and weight, please show what, in your opinion is the best angle for a V-shaped, high-speed, six-cylinder two-stroke cycle motor not having crankcase compression, how to place balance weights on the crankshaft for this motor so that the best rotary balance is obtained, and how to eliminate the unbalanced centrifugal force at high speed, the shaft to be mounted on large ball bearings at each end.

Six-cylinder two-cycle all-in-line motors in flying boats run with very little vibration but I do not favor long crankshafts.

Tampa, Fla. L. C. HANNA.

—1—The turning effort of a six-cylinder two-cycle motor is very uniform as will be noted by the curve shown in Fig. 4. This curve was produced by combining six curves as shown in Fig. 3 which is the turning effort diagram

for a certain single cylinder two-cycle motor. The crankshaft throws are set at 60 degrees. This turning effort curve is obtained from the curve of net piston pressures which is the upper one in Fig. 2.

2—No noticeable improvement in smoothness of turning effort would be obtained by the addition of more cylinders.

3—Probably the cylinders set at 90 degrees would give the best results. The method of balancing the cranks was described in the October 8 issue of THE AUTOMOBILE on page 663.

Valves Carbonize Very Quickly

Editor THE AUTOMOBILE:—I would be pleased to have your opinion on the following: A 1914 Ford car has been run about 4,000 miles, and carbon collects under the exhaust valves in from 50 to 200 miles after the valves are ground. I have had oversized pistons fitted, new valves, valve springs, carbureter, timer, plugs and coils, also master vibrator, fitted, and have used different oils and gasoline. The valves have been ground about fifteen times and after each grinding the car runs perfectly in every way, until the engine loses compression, when carbon will always be found packed under the exhaust valves. The exhaust does not smoke as though the engine was getting too much oil; there is plenty of play between the valve stems and push rods, and the timing is correct. The Ford magneto seems to give plenty of current, and the engine starts as easily on the magneto as on batteries.

Santa Rosa, Calif. W. E. V.

—There seem to be only one detail that you have overlooked and that is whether the spark is advanced as far as possible at all times. Even supposing that you drive with the spark lever advanced there is a possibility that the linkage has become loose so that the movement of the spark lever does not result in a corresponding advance of the timer.

Wants Racing Body for Ford

Editor THE AUTOMOBILE:—I would like to purchase a Ford chassis and fit a racing type of body to it. Will you please tell me where I can obtain such a body and what changes would have to be made in the chassis?

Grottoes, Va. DR. R. O. CONADA.

—The body can be obtained at a reasonable figure at any body makers. Probably $100 would cover the cost of fitting two bucket seats, gasoline and oil tanks, and painting.

Below are a few companies that are listed in the *Automobile Trade Directory* that might do this work for you:

Baily & Co., Lancaster, Pa.; Budd Mfg. Co., Philadelphia, Pa.; Collins Vehicle Co., St. Louis, Mo.; Schnabel & Sons, Pittsburgh, Pa.

The changes that you will make in the chassis depend on whether you desire a fast car or not. As far as the new body is concerned all that will be necessary is to lower the steering wheel and remove one leaf from the rear spring. If you desire an increase in speed, see the Rostrum for August 27, 1914, page 406.

Information on Most Powerful Engines

Editor THE AUTOMOBILE:—1—What cars made in America have the largest and most powerful engines?

2—What cars made in Europe have the largest and most powerful engines?

3—What cars made in America have the longest wheelbase?

4—What cars made in Europe have the longest wheelbase?

5—What cars are the longest including length of frame and wheelbase?

6—Will you supply me with the addresses of the Peerless and Marmon companies?

7—Can you inform me if the Thomas Co. is still making cars?

8—Who represents the French Berliet and the Itala cars in this country?

Ashland, Va. R. B. DEVINE.

—1—Below is a list of cars with more than 500 inches piston displacement:

Make	Cylinders	Cubic Inches	Bore and Stroke
Austin	6	667.9	4½ by 7
Chadwick	6	721.	5 by 6
Crane	6	563.7	4¾ by 6¼
Klinekar	6	503.8	4.32 by 5¾
Locomobile	6	524.8	4½ by 5½
Marmon	6	577.5	4½ by 6
Mitchell	6	595.8	4¼ by 7
Moyer	6	577.1	4½ by 5
Peerless	6	577.5	4½ by 6
Pierce	6	529.8	4½ by 5.3
Pierce	6	824.8	5 by 7
Simplex	4	590.	5⅜ by 6½
Winton	6	529.8	4½ by 5½

2—Cars in Europe with more than 10,000 cubic centimeters piston displacement are:

Make	Cylinders	Cu. Cen.	H.P.	Bore and Stroke
Benz	4	10,080	100	130 by 190
Cottin-Desgouttes	4	10,618	60	130 by 200
Isotta-Fraschini	4	10,618	100	130 by 200
Itala	6	10,634	60	127 by 140
Itala	6	12,912	75	140 by 140
Opel	4	12,978	80	130 by 165
Opel	4	15,216	100	140 by 165

3 and 4—The Simplex has a wheelbase of 12 feet while the Pierce-Arrow measures 11 feet 8 inches. Foreign cars with wheelbases of over 12 feet are: Berliet, 12 feet 6 inches; Delauney-Belleville, 12 feet; Metallurgique, 12 feet; Opel, 12 feet 4 inches; Pipe, 12 feet 2 3-4 inches; Renault, 12 feet 3 1-4 inches.

5—Cars, over sixteen feet in length over all are:

Daimler	16.8	De Dion Bouton	16.2½
Hotchkiss	16.2	Mercedes	16.3¼
Napier	16.	Opel	17.
Pierce	16.5	Rolls Royce	16.
Simplex	16.3	Spyker	16.4
Unic	16.2	Wolseley	16.6

6—The Peerless Motor Car Co. is located at Quincy Ave. and S. E. Ninety-third street, Cleveland, O. The Nordyke

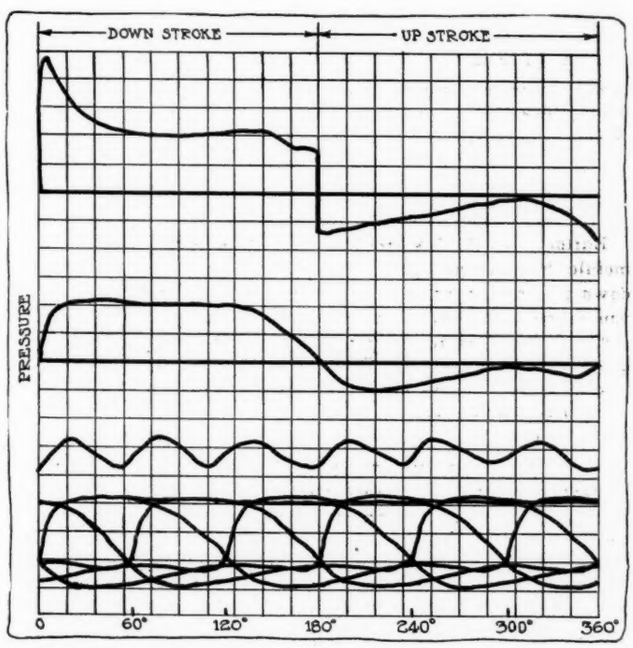


Fig. 2—Upper—Curve showing the net pressures on the piston of a single-cylinder, two-cycle motor throughout one complete cycle. This curve is a combination of the gas-pressure and inertia curves

Fig. 3—Upper, middle—Turning effort diagram produced from the above curve

Fig. 4—Lower, middle—Turning effort diagram for a six-cylinder, two-cycle motor with the cranks set at 60 degrees

Fig. 5—Lower—The six individual turning effort curves from which the combined turning effort curve, just above, was plotted

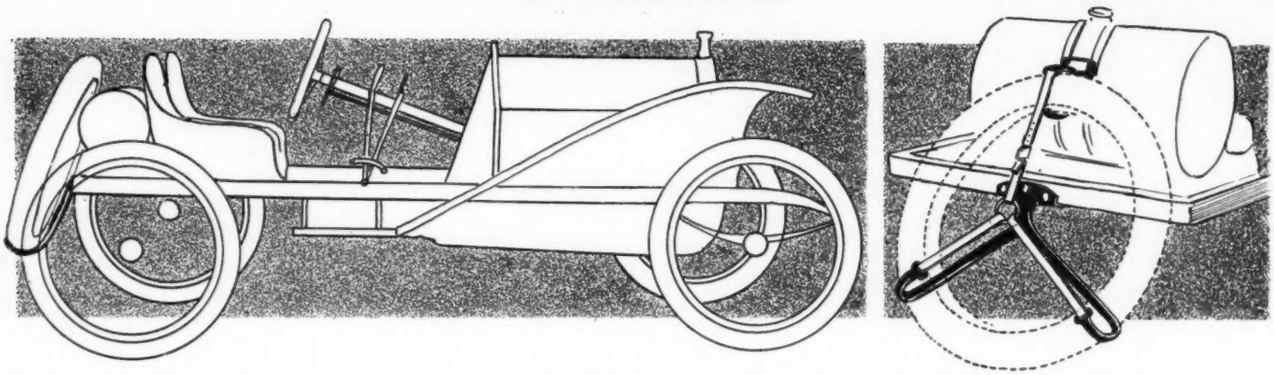


Fig. 6—Left—Hupmobile fitted with raceabout body. Right—Detail of tire carrier. Two brackets are used. One is fastened to the tank and the other to the frame, the tire being held by straps

and Marmon Co., at 1101 West Morris street, Indianapolis, Ind.

7—The Thomas Company is still making cars at the same factory, at Buffalo, N. Y.

8—The Berliet is no longer imported. Itala cars can be obtained from the Itala Import Co., Broadway and Fifty-seventh street, New York City.

Information on Acetylene Welding

Editor THE AUTOMOBILE:—Kindly inform me where I can get some information on acetylene welding? I am a blacksmith and would like to carry it along as a side line.

Is there a book published on the subject and where can I buy the necessary tools or apparatus?

Lawrence, Mass. CARL CASSE.

—A book which will probably suit your purpose is Welding, Theory, Practice and Tests, by Richard N. Hart, the McGraw-Hill Book Co., 239 West Thirty-ninth street, New York City.

Below are a few of the concerns, taken from the *Automobile Trade Directory*, that make welding apparatus: Cox Brass Mfg. Co., Albany, N. Y.; Dyer Apparatus Co., 39 Piedmont street, Boston, Mass.; Monarch Mfg. Co., 523 Stillwater avenue, Dayton, O.; Prest-O-Lite Co., 1400 Speedway, Indianapolis, Ind.

Stripping Down a Hupp 20

Editor THE AUTOMOBILE:—As I have just put my Hupmobile 20 machine up for the season and intend to strip it down to a raceabout when I get the time, I would like to have you suggest just how to go about it.

2—I would like to know how tc get more power as I have had to throw it into low on nine out of ten hills that I have come in contact with this season.

3—How could I make a tire carrier for the rear end?

Springfield, Mass. F. C. S.

—1—The Hupmobile chassis is so short that it is difficult to place a good-looking raceabout body on it unless you go to the expense of lengthening the frame. However, the appearance of the body may be improved by moving the seats about 4 inches nearer the dash and fitting a round gasoline tank. There will still be enough leg room and the rear end of the body will look longer. If you have one of the early models which are equipped with bucket seats and gasoline tank in the rear, it is hard to see how you can improve on this design either as regards weight or appearance. But if you have one of the later fore-door designs you can replace this body with bucket seats. If possible, it would be best to get one of the old Hupmobile bodies of this type. Otherwise we advise you to have a suitable body built at the nearest body makers.

2—If your car is developing less power this year than heretofore it is very evident that something is wrong. Test the compression and grind any valves that require it. Then adjust the clearance between the valve stems and push rods. If there is not sufficient space to insert a calling card between each valve stem and push rod when the cam is out of contact, then the end of the stem must be filed if your motor is an early type or if a later one the push rods may be adjusted. Adjust the carbureter carefully and examine the ignition system. See that all the brushes in the magneto make good contact, that the breaker points have a gap of 1-64 inch when separated and that the magneto is correctly timed. Push the car over the floor and if it runs hard look for dragging brakes or excessive friction in other parts. Make sure that the clutch is not slipping. If it is, on opening the throttle suddenly the motor will be found to accelerate more rapidly than the car.

3—Any well-equipped garage can forge brackets for carrying the tires at the rear. Two brackets are required, made out of round bar stock and these are shaped as shown in Fig. 6. This figure shows a Hupmobile with unlengthened wheelbase, but with bucket seats placed on the floor and moved forward 4 inches, and a round gasoline tank fitted to the rear of the seats.

No Solvent for Graphite

Editor THE AUTOMOBILE:—Please give a formula for dissolving graphite.

2—In what direction is the strain of the torque arm on a Studebaker car in starting, stopping and reversing?

3—What is the percentage of increase of strain with an increase of speed?

King, La. C. D. JOHNSTON.

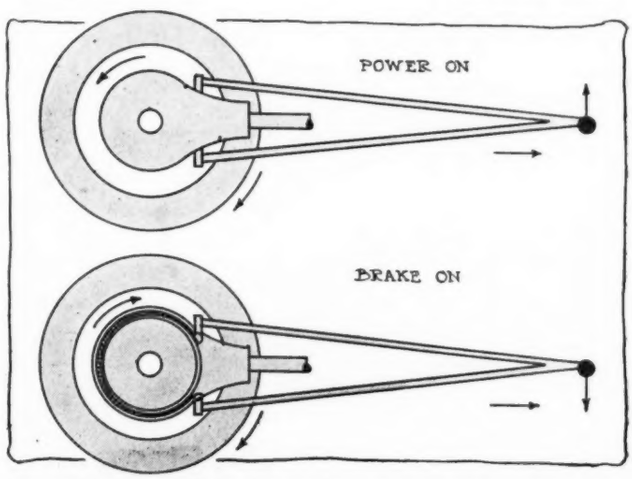


Fig. 7—Diagram showing the direction of the stress on the torque arm when the brake is applied and when the power is put on

—1—There is no substance that will dissolve graphite. Graphite is one form of pure carbon. There is a popular impression that many of the carbon removers are capable of dissolving carbon but this is not so. The compounds merely dissolves the oil holding the carbon to the walls of the combustion chamber.

2—As is shown by the arrows in Fig. 7, the stress on the torque arm when stopping is in a downward direction, the brake wheels tending to carry the axle housing and everything attached around with them, hence the downward pull on the torque arm.

In starting the stress is just the opposite, the driving pinion tending to rotate around the crown gear and carry the housing and everything attached with it.

Reversing produces a stress in the same direction as braking, the pinion tending to rotate the housing and the torque arm, downwardly.

3—The percentage increase in strain with increase of speed can not be stated without knowing the power that it takes to drive the car at different speeds.

Seven-Inch Tires Operate at Low Pressure

Editor THE AUTOMOBILE:—We have read with interest the paragraph headed Large Mileage from 7-inch Tires on page 558 of THE AUTOMOBILE dated September 17, based on information communicated to you by Mr. Thomas L. Robinson. We think this gentleman must have been mistaken with regard to the pressure at which our 7-inch cord tires are run. Contrary to the very general opinion that the larger tires call for higher pressures the reverse actually holds good, as you will see from the pressure table below:

Load per Wheel,	Minimum Inflation Pressure in Pounds per Square Inch							Load per Wheel,
Cwts.	3" 75 and 80 m/m Light Car	3½" 90 m/m Light Car	3½" 90 m/m	4" 105 m/m	5" 120 m/m	6" 135 m/m	7" 175 m/m	Lbs.
2½	35	30	..	..	..	..	..	280
3	40	36	30	..	..	..	..	336
3½	45	42	35	..	..	..	..	392
4	50	48	40	32	..	..	..	448
4½	..	54	45	36	..	..	..	504
5	..	60	50	40	..	..	..	560
5½	..	66	55	44	..	..	..	616
6	..	72	60	48	42	..	..	672
7	..	..	70	56	49	35	..	784
8	..	..	80	64	56	40	..	896
9	..	..	..	72	63	45	..	1008
10	..	..	..	..	70	50	40	1120
11	..	..	..	..	77	55	44	1232
12	..	..	..	..	84	60	48	1344
13	..	..	..	..	91	65	52	1456
14	..	..	..	..	98	70	56	1568
15	..	..	..	..	105	75	60	1680
16	..	..	..	..	..	80	64	1792
17	..	..	..	..	..	85	68	1904
18	..	..	..	..	..	90	72	2016
19	..	..	..	..	..	95	76	2128
20	..	..	..	..	..	100	80	2240
22	..	..	..	..	..	..	88	2464
24	..	..	..	..	..	..	96	2688
26	..	..	..	..	..	..	104	2912

The average load on the back axle of cars such as the Rolls Royce, Sheffield Simplex and Daimler referred to in Mr. Robinson's letter is 24 hundredweight. To carry this load a 7-inch Palmer tire only has to be inflated to a pressure of 48 pounds per square inch, a very different thing to the 110 and 125 pounds mentioned in your paragraph. The front axle weight is seldom more than 1 ton for which a pressure of 40 pounds per square inch is sufficient. Any of the smaller six-cylinder English cars fitted with open touring bodies are run with our 7-inch tires inflated to pressures of 35 and 40 pounds respectively for front and rear tires.

The 7-inch Palmer Cord Tire is capable of dealing with loads up to 2,900 pounds per wheel and for this load they have to be inflated to a pressure of 104 pounds, but no touring car approaches anything like this weight and it is only on motor lorries or as we believe you call them, trucks, that such loads and pressures are usual, even then a total back axle load of 2,240 pounds calling for a pressure of 80 pounds per square inch is more general.

We have only recently become subscribers to your journal and we have already found in it much information of interesting value which is not to be found in the automotor journals on this side.

London. G. A. PARSONS, The Palmer Tire, Ltd.

Wiring Diagram of 1913 Studebaker

Editor THE AUTOMOBILE:—1—Please show in your columns the wiring diagram of the Studebaker-Wagner single unit starter generator used on the model 35 Studebaker car made in 1913.

2—The generator does not close the relay. After the relay has been closed by hand, the output is low, gradually building up to the right amount. All this happens at the same engine speed. Generally after the car has been driven a few miles with the generator working, the relay closes and opens as the car speed varies but sometimes it opens and stays open if not closed by hand.

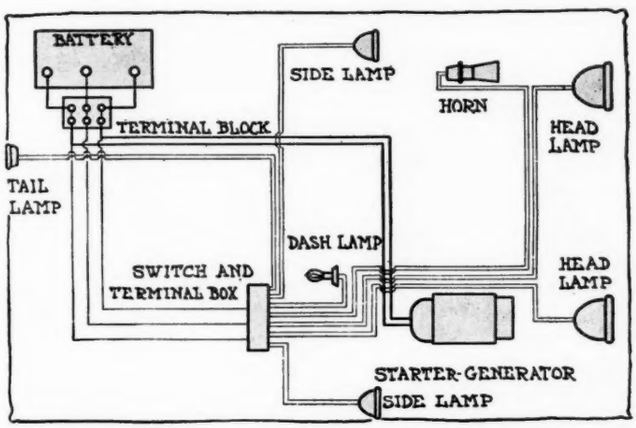


Fig. 8—Diagram of wiring of starting and lighting system used on 1913 Studebaker. Starter, generator and battery operate at 12 volts while 6-volt lamps are used. The wires from generator to battery are shown in black

The machine has been cleaned with sand paper and the brushes on the back end have been advanced, but this does not seem to help it.

Omaha, Neb. EVERETT M. ROGERS.

—1—Fig. 8 shows a diagram of the wiring system used in 1913 Studebaker automobiles. It is a 12-volt system of the double wire type. Starting motor and lighting generator are combined in one unit. The wiring connections for the starting system are shown by the heavy lines and the other lines represent the lighting wires. Since the lamps and horn are designed for 6 volts a three-wire system is used to carry current from the battery to the terminal box from which these units are supplied. In other words, the difference in electrical pressure between the two outside wires is 12 volts but the difference between each outside wire and the central one is only 6 volts. The lamps and horn are connected to the junction box.

2—The mica insulating the commutator segments has probably worn faster than the metal in the segments, and particles of metal have bridged the gaps between the segments. The remedy is to cut these small particles of metal away with a knife but this is a job that should only be intrusted to an expert. You should take your car to a Studebaker service station.

The Engineering Digest

Latest German Omnibus Construction Follows London in Worm-Drive Type But Establishes Competing Model

LAST May the Berlin Elevated Railway Company placed its first motor omnibus feeder line in operation and the vehicles of this new enterprise distinguish themselves from other motor omnibuses in Berlin by quietness and other constructive advantages. Out of the 60 new omnibuses now in commission 20 are made by the NAG company (Neue Automobil-Gesellschaft) at Berlin-Oberschöneweide and in their construction the type of compound spurwheel and bevel gear drive in the rear axle which for the last 1 1-2 year has been found acceptable by the General Berlin Omnibus Company has been adhered to. The other 40 vehicles are made by the Daimler Motoren Gesellschaft at Berlin-Marienfelde and are largely based on the latest experiences made with Daimler omnibuses in London, having the gear changes operated by silent chains and the final drive by worm in the rear axle.

A previous motor omnibus feeder line system which was adopted by the Grosse Berliner Strassenbahn A. G. (Large Berlin Street Railway Company) did not prove financially successful, but it is believed that the conditions in the present case are far more favorable, partly because much useful experience with regard to the constructive requirements has been accumulated since and partly because a feeder system is much more urgently needed for the long-distance elevated railways than for the close network of surface street cars.

In the new NAG as well as in the German Daimler omnibuses it has been one of the main objects of the builders to avoid permanently all strident noises from gearbox, rear axle and motor, while the first cost of production, the wear and the maintenance expenses and other standard considerations for omnibuses are of course also kept in view throughout. The means adopted for these purposes, so far as design is concerned, will be made clear from the following descriptions and illustrations.

Construction of the NAG Omnibuses

The chassis of the NAG buses shows in the main standard arrangements apart from the rear axle drive. The frame

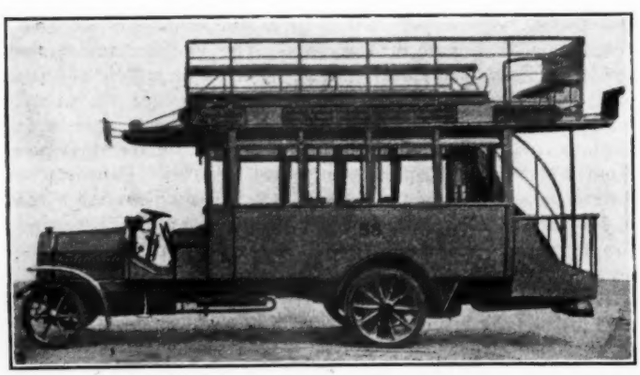


Fig. 1—New NAG omnibus, of which 20 are placed in commission in Berlin. A relatively cheap construction with danger spots carefully reinforced

reaches, pressed from 8 millimeter sheet steel, extend for almost their entire length at a height of 154 millimeters from the ground and at a uniform distance of 770 millimeters from each other; that is, without narrowing at the front. The steering angle is nevertheless sufficient, as the front wheels are so far apart as to track in the middle plane of the twin-tired rear wheels, and not with the inner rear wheels tires. Of the transverses one lies under the radiator, the next one between the clutch and the gearbox, so as to support the front end of the latter, the third and strongest one at about the middle between the axles, where it takes up the entire traction push. The fourth one comes near the front shackles of the rear springs and the fifth so far from the rear end of the reaches as to leave room for the convenient riveting of two brackets for the support of the boarding platform of the omnibus. These brackets are braced by diagonal struts, though this is not shown in the plan view, Fig. 2.

Motor Very Conservative

The four-cylinder motor, with cylinders of 110 by 150 millimeter bore and stroke, develops 32 to 35 horsepowers at 900 revolutions per minute, and is of the T-type, the cylinders cast in pairs. It is supported in the frame by two transverse steel straps which are sufficiently flexible to protect the crankcasing against any bad effects from warping of the vehicle frame. Silence of valves is secured solely by suitable shaping of the cams and not by the usual boxing. The carbureter is placed between the two cylinder castings and draws its air through a pipe with intake around the exhaust manifold on the other side of the motor. The magneto and the centrifugal water pump are on the exhaust side on a shaft parallel with the camshafts and driven from the camshaft gear. Automatic oiling of the three crankshaft bearings is effected by means of a gear pump driven from the middle of the camshaft on the intake side by miter gear and a vertical shaft, as shown in Fig. 3. The oil is not driven to a level higher than that of the crankshaft and thence led by gravity to the bearings but is forced into a distributer tube along the wall of the casing and from this tube by short leads upward into the bearings; a longer branch tube takes a portion of the oil to a sight glass on the dash. The quantity of oil in the circulation is determined experimentally and is not subject to adjustment. Similarly the oil in the sump for cylinder lubrication by splash remains at an unchangeable level, so as to obviate smoky exhaust as much as possible by simple means.

Cone clutch, four-speed gearbox with direct drive on high gear and service brake at the rear and, finally, the usual driveshaft with universals at the ends transmit the power to the compound bevel and spurwheel gear on the rear axle which is the principal feature departing from standard design. The gear ratio between the driveshaft *a* and the rear wheel shaft *l* is here determined by the bevel gear proportion of 13 to 45 and the spurgear proportion of 21 to 41 giving a total ratio of about 1 to 6.75 on high gear, at which *a* revolves at the same speed as the motorshaft. The maximum vehicle speed at a motor speed of 900 revolutions is hereby limited to 21.6 kilometers per hour, a centrifugal governor on the camshaft limiting the motor speed by throttling the carbureter.

The rear axle consists in the main of three parts. The steel casting *f* in the middle is divided lengthwise horizontally

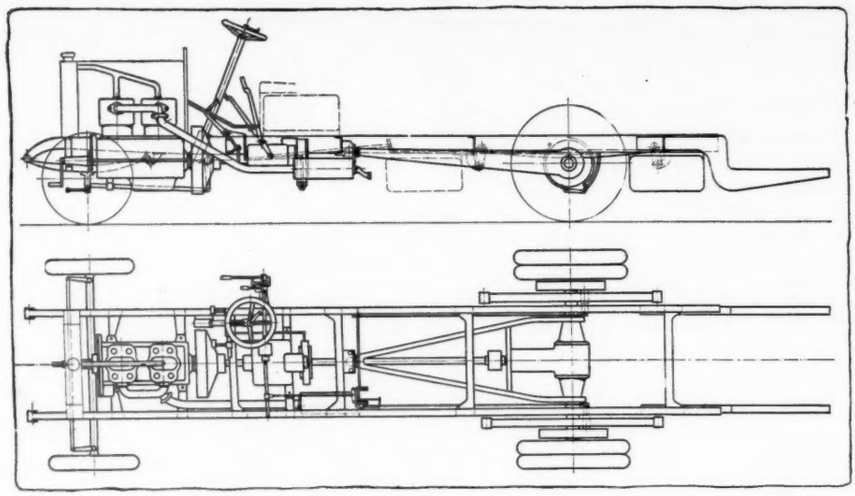


Fig. 2—Outline views of NAG omnibuses with T-type, low-speed motor and compound spur and bevel gear in rear axle

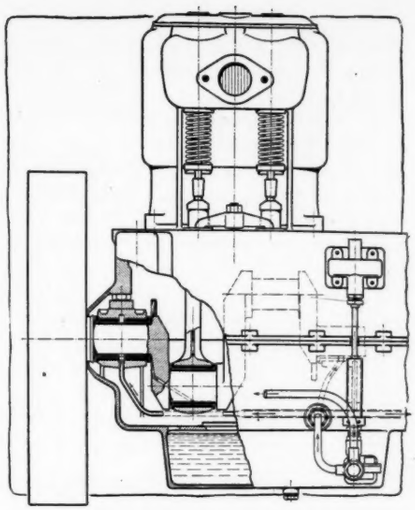


Fig. 3 A—Side view partly in section, showing oiling system, of NAG motor

and carries the transverse box g which is undivided and completely inclosed to the exterior and in which the short jackshaft h for the small spurwheel d runs in very stout ball bearings. The large bevel wheel c is mounted on the same shaft h, jaw-coupled to spurwheel d, but it is not mounted with a drive-fit and is therefore susceptible of such slight lateral displacement as has been found in practice to secure quiet running. The correct alignment of the spurwheel d is secured by the small end-thrust bearing on one side and the adjustment nut i on the other. The final spurwheel e is mounted on the housing k of the differential which runs on ball bearings in the axle and contains the usual cluster of bevel pinions mounted by means of bushings, and the hubs of the pair of pinions splined to the wheelshafts are especially long, the details of the whole construction being shown very plainly in the scale drawing, Fig. 4. The bevel gear driving-pinion b is made in one piece with shaft a and is carried very securely in the front portion of the casting f by means of three radial and one side-thrust ball bearings. The splines in the hubs of the side pinions of the differential and those upon the wheelshafts l are made very accurate, so that the shafts may be withdrawn easily after unscrewing the wheel caps m, in case of an exchange of driving-wheels.

The wheels are pressed upon steel hubs o, which are provided with the oilcups shown in dotted lines, and these revolve upon bushings between steel rings p and q. Ring p is screwed upon the axle and ring q is secured by nut r which is furthermore pinned to the axle end.

The customary triangular frame transmits the driving thrust and torque to the middle transverse of the vehicle frame without any intermediation of the vehicle springs and abuts with its front end against a steel ball; it follows therefore every small lateral movement of the rear axle which can occur when the rear springs are flexed unevenly. The reaches s of the triangular frame are secured by bolts to hubs t which are pressed upon the rear axle, and boxings carrying the rear springs are mounted upon the same members. The reverse torque arising from braking is also taken up in the axle construction without reaching the springs, the brakeshoe carriers u being secured to the axle by cones and

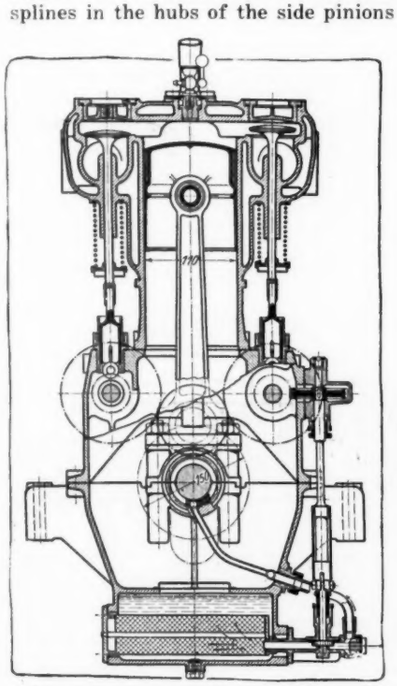


Fig. 3 B—Cross-section of NAG omnibus motor silenced by gentle cams, low speed and accurate gears

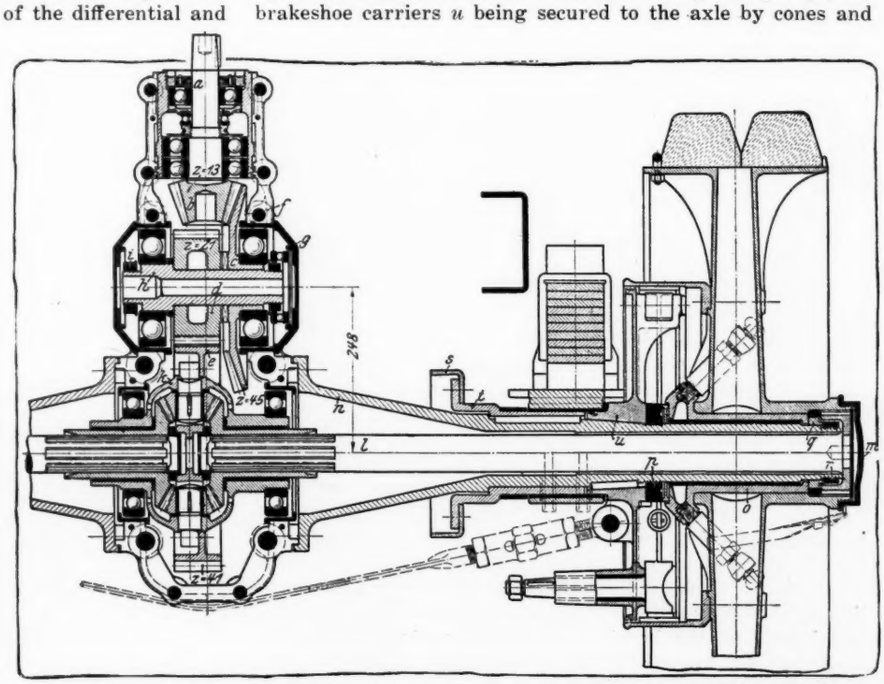


Fig. 4—Rear axle gear and drive of NAG omnibuses, involving many details intended to secure noiselessness and durability. Casing is divided horizontally, excepting middle portion g, which is undivided. Parallel wheel bearings

wedges; they are formed as disks which snugly close the face of the brake drums and the brace rod under the axle is secured to them.

By the construction described the driving system remains entirely unaffected by the load or turning movements of the vehicle, this being an urgent requirement where the question is of such weights as come into play in the case of omnibuses. The silence of the system is due in some measure to the gear reduction arrangement by which the bevel gear precedes the final spurwheel gear, rather than having the action of the latter incorporated in the gearbox, as it is an old experience that it is more difficult to quiet a spur gear than a bevel gear above certain circumferential speeds.

The objections to the system lie perhaps exclusively in the great weight of the rear axle gear which involves severe stresses on rough pavements and may come in conflict with regulations prescribing maximum axle loads.

Construction of the German Daimler Buses

As compared with previous types of Daimler buses the general arrangements of the chassis show the change that the gearbox has been moved further back and is supported separately from the gear-shifting shaft. The pressed-steel frame is relatively narrow and the front wheels track with the inner ones of the rear twin tires.

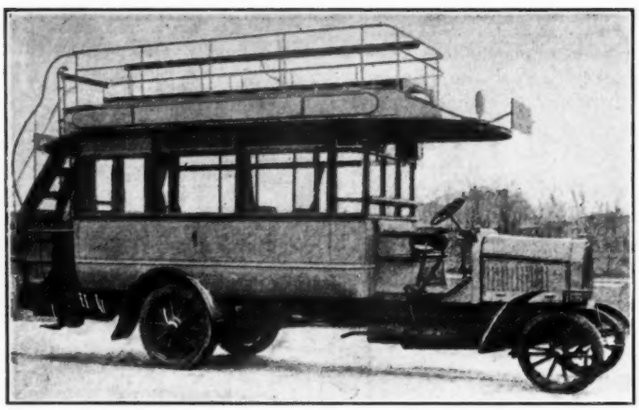


Fig. 5—German Daimler omnibus with worm drive and silent-chain gears; 40 placed in commission in Berlin

The motor is hung in the frame at three points, with the apex in the front transverse; the cylinders are cast in pairs, and the valves, in removable boxings in the cylinder heads, are operated from a single camshaft by rocker arms, the advantages in fuel economy being those generally obtained from this type. At the speed of 1,150 revolutions, which gives 43 horsepowers, the maximum, a mean piston pressure of 6.4 atmospheres is maintained, which is unusual. [Details and illustrations of the motor are here omitted, as it follows the well-known Daimler type closely.—Ed.]

The cone clutch differs from previous designs for omnibuses by eliminating end-thrust upon the motorshaft from the clutch spring whether the clutch is in or out. That this is the case when the clutch is in action is immediately apparent from Fig. 6 which shows the construction. When the clutch is released by pressure on pedal *d*, the toggle joint of levers *e* and *f* is flattened and, as *f* abuts in the ball bearing *h*, which is fixed, the other ball bearing *g* is shoved forward, and thereby the cone *b* is released from the flywheel, being at the same time braked by the resiliently mounted brake ring *i*. The axial pressures from clutch spring *a* are completely balanced between the bearing *h* and the spring cup *c*. As, further, no pressure can be transmitted backward to the pedal through the flattened toggle joint, the operation of the clutch does not become fatiguing.

The leather disk universals between clutch and gearbox, as

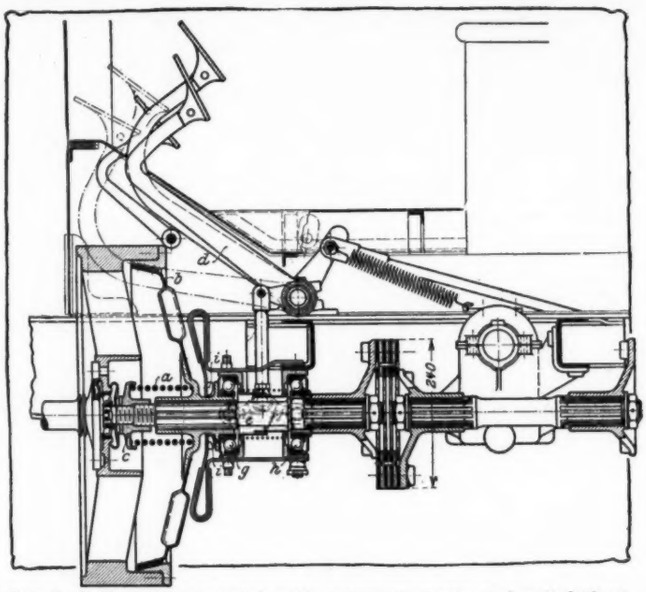


Fig. 6—Self-contained clutch with automatic brake and anti-fatigue toggle lever

well as between gearbox and rear axle, constitute an innovation in German practice. Each joint consists of three rings of sole leather separated by sheet steel disks and riveted together, and they are gasped from the opposite sides by three-armed spiders which are staggered with relation to each other; at least one of the spiders, whose hubs are splined to the shafts, is capable of longitudinal movement.

The change-gear, Fig. 7, differs from the British prototype by its larger dimensions. To obtain silent operation, the third speed, being that mostly employed, is direct, and the other gears are actuated by silent chains and non-slidable sprocket wheels.

From shaft *a* shaft *d* is constantly driven by the gear *bc*. Shaft *e* runs reversely with minimum speed when the spurwheels *f* and *g* are in mesh, and with the highest forward speed when the clutch wheel engaging its hub portion is shoved forward and couples the chain gear *hi* to shaft *e*. The second speed is obtained by coupling sprocket *m* to shaft *e* by means of clutch *k*, and the third speed by moving the same clutch forward, connecting shafts *a* and *e* directly. All engagements are protected against unintentional displacement by the well-known locking system for the shifting-rods.

The dimensions of the gearbox are necessarily large with the chain system, and intermediate bearings are therefore required for the shafts to avoid vibrations. For the same reason the casing is braced by horizontal transverses at two different levels. Underneath it a rounded pan protects the street from drippings.

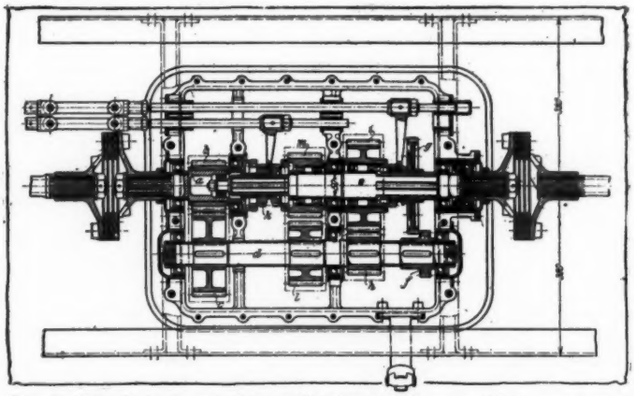


Fig. 7—Silent-chain gearbox with direct drive on third speed and leather universals

The rear axle design is shown in Fig. 8. Its most characteristic feature is of course the worm drive. The quintuple steel worm *a* is hardened and ground and drives a 32-teeth bronze wormwheel *b* mounted on the differential housing. The whole drive is so mounted in the cover *c* of the rear axle casing *d* that it can be removed easily in its entirety from above. The worm is as usual secured by an exceptionally strong double-acting end-thrust bearing at the end of the shaft, and the wormwheel is secured laterally by thrust bearings at the sides of the differential. The steel casing *d* is stiffened by internal ribs and is bolted to the flared axle tubes. These are supported at their outer ends in ball bearings, and

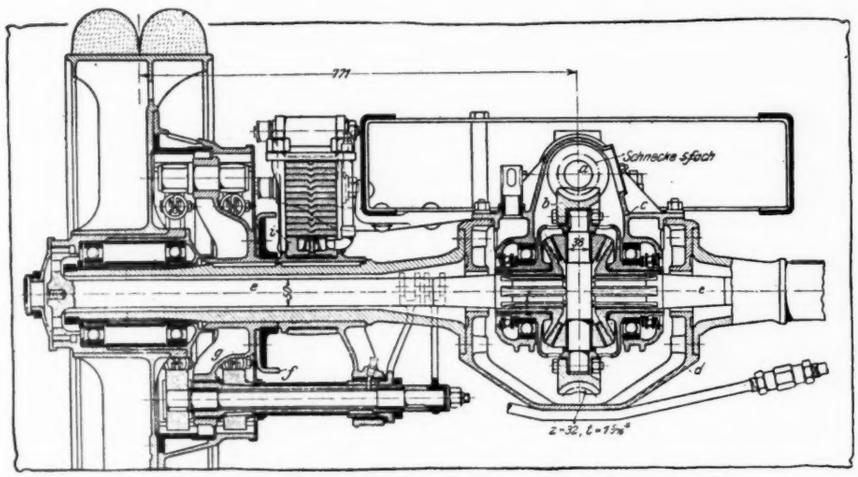


Fig. 8—Rear axle construction of German Daimler omnibus

the connection between the forged end-pieces of the wheel-shafts and the wheel hubs are in the nature of slightly movable spur joints. To compensate for the lack of a service brake on the transmission, each wheel carries two separate brakes side by side, and their drums, 20 inches in diameter, are separately removable.

The rear axle transmits traction thrust, as well as reactions from starting and braking, by two struts which are bent to an upward curve at their forward ends and susceptible of turning upon horizontal pins in the middle transverse of the frame. The rear ends *f* of the struts are rigidly secured to the brake-shoe carriers *g* which are pressed upon the rear axle. For further security the middle front portion of the rear axle is braced against a transverse *h* connecting the two struts as shown in Fig. 9, so that all torsions are taken up at this point and the pressed and wedged joints are relieved. The springs are also relieved of all traction and torsion stresses; their clip boxings are mounted with bushings which can turn upon the rear axle and are provided with special grease cups to prevent them from rusting on.—From *Zeitschrift des Vereines Deutscher Ingenieure*, August 8.

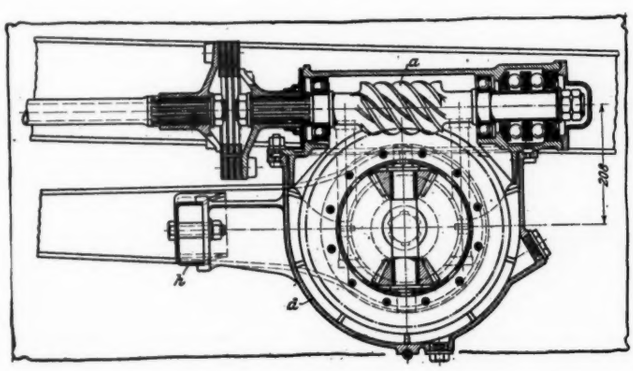


Fig. 9—Worm drive, showing also brace h for torsion struts

Recent Court Decisions —Father Pays Damages

Court says that an 11-year-old boy is so young that he is presumed to be inexperienced and unfit to drive a large automobile.

In a recent case a man sued because his wife had been run down and injured by an automobile driven by an 11-year-old boy. It appeared that the man sued had purchased the car for his son and allowed him to drive it; that the boy had used the car several months and had driven 3,000 miles.

The Court said that it was not willing to hold that a powerful, heavy machine, such as the one in question, in the hands of an 85-pound boy, not yet in his teens, speeding along the streets of a populous and busy town might not become a menace to the lives of the people attempting to cross the street in front of it. It further stated that an automobile could not be held to be a dangerous appliance as a matter of law, because they have grown to be a part of the life of the country and when properly handled, and driven, are useful and convenient vehicles. Judgment was given against the father, however, by the Court on the theory that the parent had not used reasonable care and should have anticipated an accident as a result of permitting the child to use the car.—*Allen vs. Bland*, 168 *S. W.* (*Texas*) 35.

Experiment Not Admissible

Man may not testify that, by experimenting with his automobile, he found he was able to stop within a shorter distance than a chauffeur stopped who ran down a person.

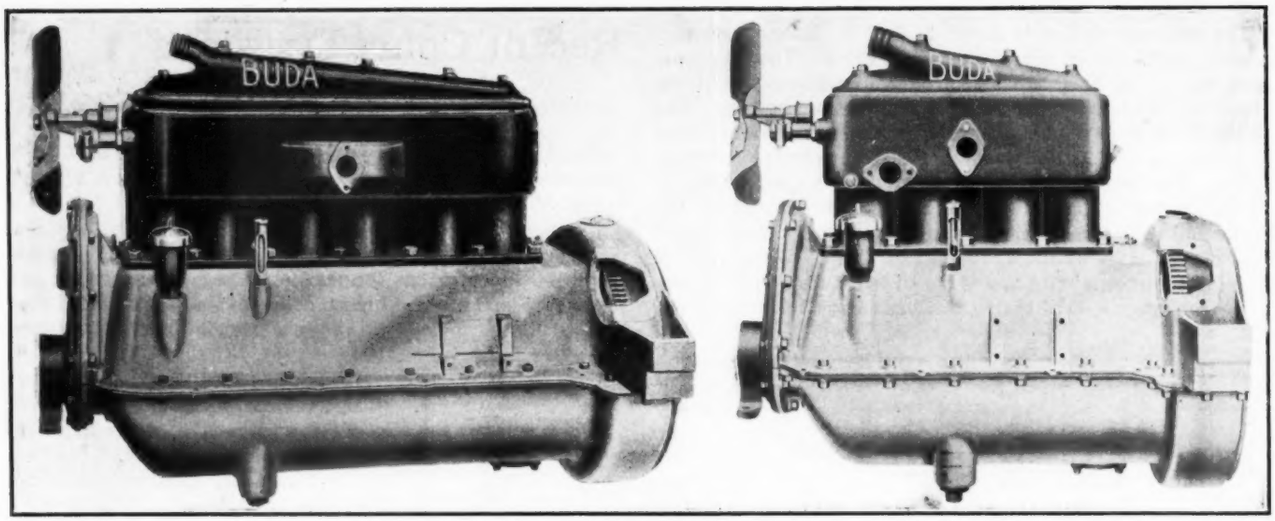
A man was injured in a collision between a carriage, in which he was riding, and an automobile, which was coming along the road in an opposite direction. The injured party endeavored to have a friend testify that he had experimented with his car at the place of the accident and had found that he could stop quicker at a given speed than the chauffeur had done.

The Court held that, as the conditions were not the same at the time of the accident as they were at the time of the experiment, the testimony was not proper, and that this evidence was particularly improper because the cars were not of the same make or of the same horsepower.—*Beckley vs. Alexander*, 90 *Atlantic* (*New Hampshire*) 878.

Owner Responsible for Family

In Washington an automobilist must pay damages to an injured person when his car is negligently driven by some member of his family.

A motorcycle and an automobile collided at a street crossing and the motorcyclist was thrown and injured. The automobile was owned by a husband and wife as community property and was used by them together and also for selling real estate. The wife was not in the car at the time of the accident, but it was being driven by her daughter. The motorcyclist sued the husband and wife together for his injuries and the Court held that the owner of an automobile, who purchases the same for the use of his family, must pay damages to a third person who is injured through the negligent driving of any member of his family who has permission to drive the car.—*Switzer vs. Sherwood*, 141 *Pacific* (*Washington*) 181.

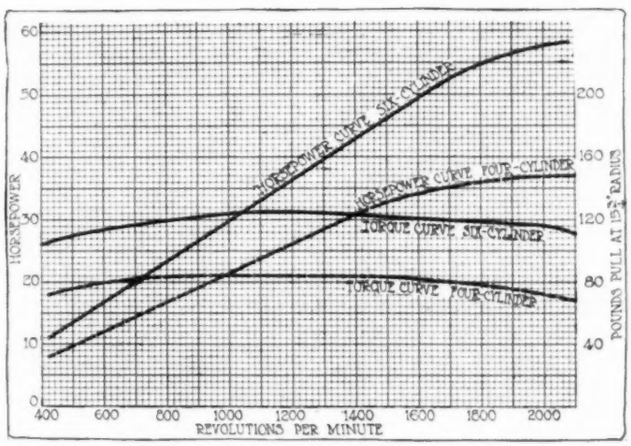


Left—Left side of new six-cylinder Buda motor showing clean exterior of block casting. Right—New four-cylinder Buda type. Note provision for attaching electrical systems to both models

Buda Brings Out New Four and Six

Both Block Designs of L-Head Type—Unit Feature Is Optional

TWO new power plants have been brought out by the Buda company of Harvey, Ill., manufacturer of the Buda automobile motors. Both of these are 3.5 by 5.125 inches, one being a six and the other a four. The design of the two is exactly similar throughout save for the number of cylinders. Both have their cylinders cast in a single block and are of L-head design.



Horsepower and torque curves of new four and six-cylinder Buda motors

Both Three-Point Suspended

The weight of the four, which is known as model "RU" is given by the manufacturer as 375 pounds with regular equipment. The six is stated to be 525 pounds with regular equipment, Both motors are designed for three-point suspension, and, although intended originally to be unit types, will be furnished without the unit feature if desired.

The cylinders are of gray iron and have been made with an extra large waterjacket space. To further insure efficiency in cooling, the water is baffled so that it is discharged from the pump directly beneath the valves and arranged to secure a complete circulation around each individual cylinder. The top of the cylinder is provided with a cover which can be removed, allowing for access to the upper part of the waterjacket space. The base flange of the cylinders is extended in the form of a shelf and the valve lifter guides are mounted in openings drilled in this shelf. This gives a compact arrangement for supporting the guide lifters and pushrods and provides for lubricating these parts by means of communication with oil from the crankcase.

Mudpan Hangs from Lugs

The crankcase is cast from aluminum alloy and divided horizontally into two parts. The upper part contains the complete crankshaft bearing supporting members and includes the entire bearing assembly. The lower half of the crankcase serves as an oil pan. A feature which will be appreciated from the standpoint of accessibility is the fact that lugs are placed on the crankcase to support the mud apron, doing away with the necessity of hanging this from the main frame.

In arranging the crankcase for the three-point suspension, the rear supporting members are two in number and are provided for by arms cast integrally with the upper half of the case and arranged to bolt directly to the main frame. The forward end of the motor is supported at the crank center by a trunnion bracket arranged to rest upon a dropped cross member of the frame. This means of support allows the bottom end of the crankcase to be removed without interfering with the upper part.

Clean Exterior Appearance

The exterior appearance has been kept clean by inclosing the valve mechanism, which is all on the right side of the motor, allowing plenty of room for installing the steering gear in left drive cars. The length overall of the six-cylinder motor from the face of the fan to the rear of the cylinders is 35 11-16 inches. This dimension on the four is 25 9-16 inches.

The pistons are cast iron ground to size and in accordance with up-to-date practice, are drilled with oil relief holes through recesses to prevent the lubricant from being drawn up into the combustion space, causing smoking and carbonization. The rings are cast iron, diagonally split eccentric. They are ground on the periphery and also on the sides.

Open hearth steel is used for the piston pins and these are case-hardened and finish ground to fit the pistons.

Open hearth steel drop-forged and heat-treated is also used for the connecting-rods which are I-beam section. These are machined and reamed to accurately locate the centers and are not offset. The upper end of the rod is bushed with phosphor bronze; the lower end is fitted with die-cast nickel babbitt bearings. Connecting-rod bolts are heat-treated steel.

Four main bearings are employed on the six and three on the four. The crankshaft is drop-forged open-hearth steel, heat-treated, machined and balanced on a Norton machine. The heat-treating process, according to the Buda company, gives the crankshafts a tensile strength of 120,000 pounds per square inch and an elastic limit of 85,000 per square inch. The dimensions of the three bearings on the four are as follows: Front, 1.75 by 2.875; center, 2 by 2.25; rear, 2.125 by 3.25. On the six the diameters and lengths of the main bearings are as follows: Front, 1.75 by 2.875; two centers, 2 by 2.25; rear, 2.125 by 3.25. In both motors the connecting-rod bearings are 1.875 inches in diameter and 2 inches in length.

Helical Timing Gears

Helical timing gears, cut on automatic hobbing machines, drive the camshafts. The timing gearset is composed of one crank, one cam and one pumpshaft gear which are accessible by the removal of the gearcase cover. The camshaft and cams are forged in one piece from open-hearth steel, machined and case-hardened. On the four the camshaft is carried on three bearings and on the six, on four. The cams are designed for quietness and are a modification of the sharp contour type, avoiding hammering between cams and followers.

Cooling is by means of a centrifugal water-circulating pump fitted with a bronze runner. The water pipes are exceptionally short and are designed to connect to the radiator without a bend in the hose. The fan is mounted on antifriction bearings and has a belt-tension adjustment.

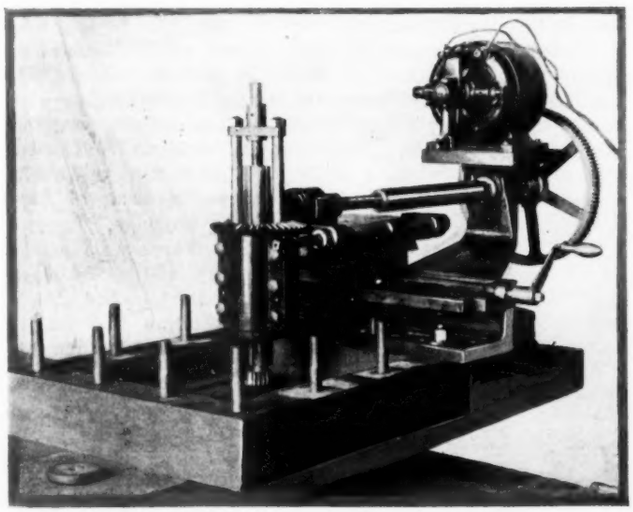
Force-Feed and Splash Lubrication

Lubrication is accomplished by force feed as regards the main bearings and by splash to the rest of the motor. The oil is pumped from the reservoir in the crankcase by a gear pump to the main bearings, the lead from the pump entering the top of the bearing and providing oil for the frictional surface at these points under pressure. Overflowing from the forward and rear ends of the main bearings, the oil enters the splash pockets and the dip of the connecting-rods into these provides the oil space which takes care of the cylinders and all other interior working parts. A separate lead takes a constant stream of oil from the pump to the timing gears.

Provision for Accessories

Provision is made for attaching most of the standard ignition starting and lighting systems. The clutch may be housed in the flywheel, which is attached to the crankshaft by a large flange with six steel bolts. The diameter of the flywheel in both motors is 17.25 inches. This follows the practice of making everything interchangeable on these two motors, reducing to the utmost manufacturing costs. In both engines the intake manifold is designed for a 1.25-inch carbureter. S. A. E. standards are used for connection of accessories, and the spark plugs are also to the society's dimensions, being 7-8 inch, 18 standard thread.

Portable Electric Milling Machine for Small Jobs on Heavy Work



Portable electric milling machine of new design manufactured by the Pedrick Tool and Machine Co., Philadelphia, Pa.

A PORTABLE electric milling machine can be used to good advantage for small jobs on heavy work. In this state of affairs it is much cheaper to carry the machine to the work rather than the work to the machine. Accompanying illustration shows the machine of new design that will be found very convenient for a great variety of purposes.

This is a portable electric milling machine suitable for being carried to the work and mounted on it. In this manner it can handle many jobs on an assembled part that would be exceedingly awkward on a regular milling machine and which in fact would generally require the dismantling and removal of the part upon which it is working.

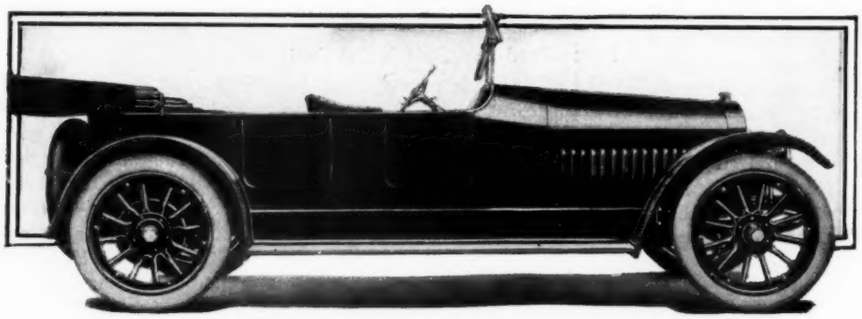
The particular job shown in the illustration is the milling of the seat and port edges of an engine valve. The method of mounting the milling machine is also clearly shown in the illustration. It is secured by means of bolts passing through longitudinal slots in the base. By the same arrangements the machine can be mounted vertically as well as horizontally.

One of the advantageous features of the milling machine is that the spindle stands clear of the base, rendering the work exceptionally accessible. The longitudinal travel of which the instrument is capable is 12 inches and the cross travel, 6 inches. There is a range of vertical of 6 inches. In place of the automatic adjustment generally used on the larger milling machines, hand adjustment is provided for by the longitudinal and cross travels. This is in keeping with the idea of rendering the machine as light as possible as it does away with the weight and complication necessary with the automatic adjustment.

Some of the purposes for which this milling machine may be used are the milling of engine and pump valve seats, port edges, key seating shafts, facing pads on large frames, etc. By manipulation it can also be made to perform other tasks, even drilling. A special attachment with V-shaped seats can be supplied for mounting the machine on shafts for key seating.

The driving power on the instrument is supplied by a .25-horsepower Westinghouse electric motor running at 1,725 revolutions per minute. The machine is manufactured by the Pedrick Tool & Machine Co., Philadelphia, Pa.

Pilot 55 Horsepower Six for $1,885



Pilot 55 horsepower model selling for $1,885

Fitted with Two and Five-Passenger Bodies— Two Other Models with 60 and 75 Horsepower Motors

THREE sixes make up the 1915 line of the Pilot Motor Car Co., Richmond, Ind. One of these, the 55, is an entirely new addition and takes the place of the four manufactured for the 1914 season, the other two, the 75 and 60, are continuations of the product of the present season.

The new six, which is the Pilot leader for the 1915 season, follows the latest dictates in six-cylinder design. Built on a chassis of 126 inches wheelbase, and fully equipped, it sells for $1,885 in two- and five-passenger bodies and for $100 additional in the seven-passenger. It is a big, roomy car of ample carrying capacity, 34 by 4-inch tires, has the popular 3.5 by 5.25 motor and cantilever springs.

Like all other Pilot cars the power plant is a product of the Teetor-Hartley Motor Co. of Hagerstown, Ind. The makers place a rating of 55 horsepower on this motor as measured on a torsion dynamometer. It is a T-head design with the cylinders cast in a block. Although the intake and exhaust manifolds are cast separately and are placed on opposite sides of the cylinders a very simple exterior has been maintained, as the valves and their operating mechanism have been inclosed by long cover plates.

Three-Ring Pistons

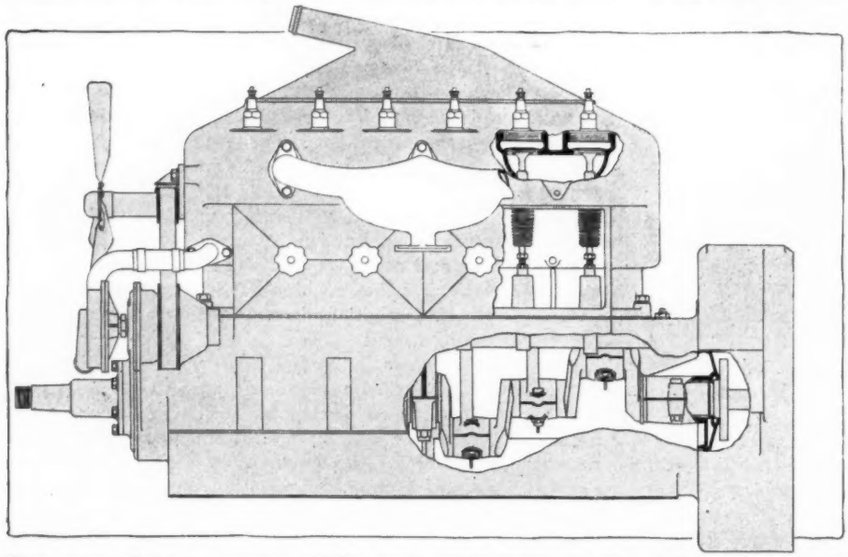
Three eccentric rings are fitted to the cast-iron pistons. These rings are ground on the piston as well as on the cylinder side to assure a minimum gas leakage. The piston pins are of chrome-nickel steel and are secured in the connecting-rods. The bosses in the pistons provide the bearing surface and the makers claim that a distinct advantage is gained in this, owing to the higher percentage of bearing surface as compared to the practice of fixing the pins in the boss.

The connecting-rods are of the standard I-beam section, drop-forged from carbon steel. In the Teetor motors the same grade of steel is used in the connecting-rods as in the crankshafts. The diameter of the bearing at the lower end of the connecting-rod is 1.875 inch and the length 2.25. Following the best practice, the bolts holding the connecting-rod bearing caps in place are of nickel steel. These bolts must take all the strain of the drive once in every revolution and manufacturers are almost without exception using alloy steel at this point.

Three Main Bearings

Three large main bearings lined with die-cast, nickel babbitt support the crankshaft. The front bearing is 2 inches in diameter and 3 inches long; center, 2.5 by 1 11-16; rear 2 by 3.5. All six crankpins are of course of equal diameter, this dimension being 1.875 inches. The main bearings are supported by the upper half of the aluminum crankcase so that the bottom pan of the motor can be removed without disturbing the bearing adjustments.

Helical timing gears are used. These are inclosed in an oil-tight compartment at the front end of the crankcase. On the Teetor motors the camshafts are not a drop-forging. Instead a special alloy is used which, the makers claim, possesses a high degree of rigidity, thus meeting the prime requirement of a camshaft. Die-cast nickel-babbitt bearings, the same material as used for the crankshaft bearings, are used for the camshafts. These bearings are three in number and of generous size. In fact the whole valve mechanism is of ample proportions. The valves themselves are 2.25 inches in diameter and have a lift of 5-16 inch. The push rod guides are 2.5 inches long.



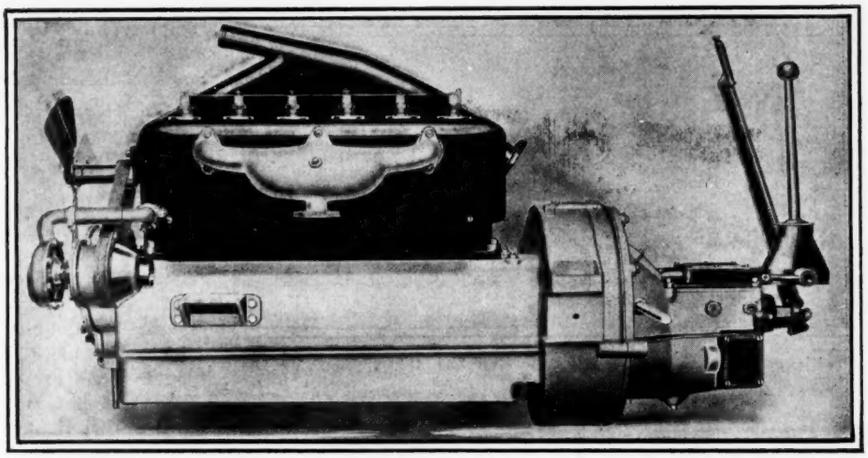
Pilot motor showing mounting of the pump at the front and the valve mechanism and crankshaft construction

Patented Splash Lubrication

Lubrication is by a patented splash arrangement. Two overflow oil basins into which the connecting-rods dip are fastened in the lower half of the crankcase. In the bottoms of these two oil troughs there are drilled holes which are of sufficient size to admit a definite quantity of oil. As the lubricant is circulated by the connecting-rods, it is replaced by the oil supply which is furnished through the oil holes. The faster the motor runs, the faster the

oil is pumped to the splash troughs and an increase is given in direct ratio to the speed. The overflow from the bowls, as in all circulating splash systems, finds its way back to the reservoir in the bottom of the crankcase. A large oil gauge is placed close to the breather pipe.

A centrifugal water pump circulates the cooling water through a cooling system that has been carefully designed to be adequate as regards jacketing space. The radiator is a Mayo square-tube. The water pump has one feature that makes it of unusual interest in that it has but one packing gland instead of two. This reduces by 50 per cent. the chances of leakage at this point. The water chamber at the top of the motor is larger than usual as will be noted from a side view of the engine. It resembles very much a water header for a thermo-syphon system.



Unit power plant used in the Pilot 55. A Teetor 3.5 by 5.25-inch motor is employed

In equipping the cars electrically for this season the magneto has been dropped and in its place a combined lighting and ignition generator of Westinghouse manufacture has been substituted. The cranking motor is a flywheel installation and is also a Westinghouse. The lighting and ignition generator is mounted on the left side of the motor on a platform so arranged that the drive is taken from the pump shaft. A rather ingenious method of balancing the pump and generator drive has been made use of. Referring to the side view of the engine it will be seen that the water pump is mounted forward of the timing gear case. In this way the water pump shaft does not have to pass through the pump housing and the use of the single stuffing box as previously mentioned results. A further advantage is that the load on the bearing is equalized in a longitudinal direction.

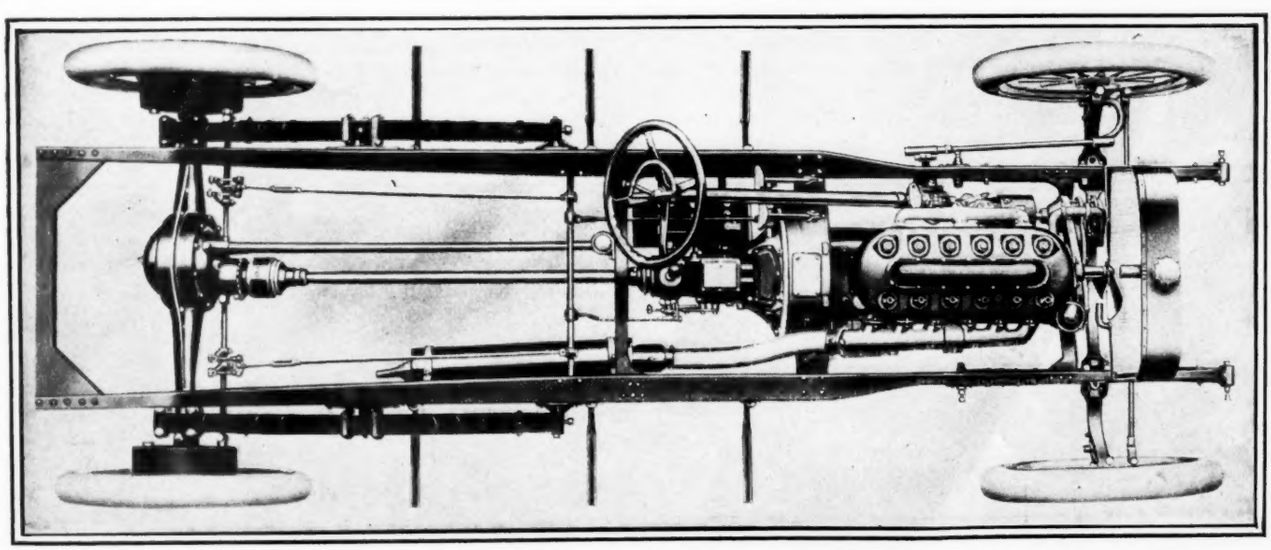
Gravity Feed to Carbureter

A gravity feed gasoline system is used. The tank has a capacity of 19 gallons and is located under the front seat. The angle in the tube leading from the tank to the carbureter is 15 degrees. This means that up to an angle of 15 degrees the last drop in the tank would pass through the system. The more gasoline there is in the tank in such a system, the greater the angle at which it will feed, but with this angle, with a pint of gasoline in the tank the flow would be as good as with the full 19 gallons up to an angle of 15 degrees. A feature in the economy of this car is the design of intake manifold. This is an aluminum casting so arranged as to give a balanced feed to all cylinders. It is provided with a gas chamber which will be noted in the side view of the motor.

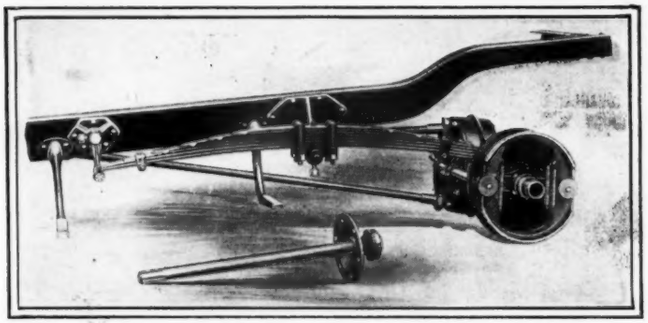
The clutch and gearbox are contained in a unit housing which is bolted against the rear face of the crankcase forming a unit power plant. Both the clutch and gearset are products of the Warner Gear Co. of Muncie, Ind. The clutch is a wide leather-faced cone with engaging springs and provided with a ball thrust to take the load of the engaging spring off the crankshaft of the motor. The gearset provides three forward speeds and is provided with gears of chrome vanadium steel.

The drive shaft is fitted with a universal joint at each end. The units on the drive from the gearbox through the rear axle are all of 90 horsepower capacity. The heavy construction is carried even to the housing of the rear axle which is of 7-32 inch pressed steel. This is unusually heavy as it is common practice on many cars of sturdy design to use 5-32 inch material here. The axle is floating and is a special Pilot design manufactured in the Hess shops.

Nickel steel gears and chrome-nickel steel shaft are used in the differential. The shafts are 1.5 inches in diameter and the rear wheel bearings have a guaranteed load capacity of 7,800 pounds. This is exceptionally heavy construc-



Pilot 55, six chassis showing mounting of motor and drive mechanism. Note connection of torque member and cantilever rear springs



Cantilever spring suspension and torsion bar arrangement on the Pilot 55

tion as the makers claim a weight of but 3,150 pounds for the entire car, fully equipped.

A double set of internal expanding brakes act on drums bolted to the 34-inch artillery wood wheels. The tires are 34 by 4 all around.

The frame construction is of particular interest in the Pilot car because, as in the rear axle, especially strong materials have been used. The frame stock is 7-32 inch thick and the channel webs are 5 inches deep. The flanges are 3.5 inches in width with reinforced front ends and at the rear is braced against racking with heavy gusset plates. Ample provision of strength has been made against the three causes of frame downfall; racking, crystallization and sagging.

The cantilever rear spring used in the new six is an innovation for the Pilot concern. Previous products of this company have been fitted with semi-elliptics. The springs used in all the Pilot line though are distinct in that use is made of the imported English Sheffield steel.

The other two sixes have larger motors than that in the car just described. On the 75 there is a 4.5 by 6 Teetor power plant with T-head cylinders. This car has many of the general features of design that are incorporated in the little six. It has the cone clutch, Warner gearbox, and the same type of drive. The rear axle, however, is a Timken and the units are larger to accommodate the more powerful motor and the longer wheelbase of 132 inches. The tires on the 75 are 37 by 4.5, both front and rear. Center control is used on this car, but the purchaser has his choice between left or right drive. The price of this car fully equipped in either two, four, five, six or seven-passenger body types is $2,885. The colors are optional although plain blue, brewster green, brewster green with ivory panel or violet with ivory panel are standard.

The Pilot 60, known as the Empress model, has also the T-head block Teetor motor. In this instance the bore is 4 and the stroke 6 inches. It is built in seven-passenger and roadster bodies and fully equipped sells for $2,585.

This model is essentially the same as the 75, being mounted on the same chassis. The axle is smaller in the 60 but is of Timken manufacture and the radiator which is a Mayo the same as in the larger car has a .5-inch shallower core than is necessary with the larger engine. A choice of left or right drive is offered in this car also. The Empress model as well as the 75 has undergone a change in the electrical equipment for this season being now fitted with the Westinghouse two-unit system in which the generator performs the function of ignition as well as lighting.

Marr Car, Weighing 600 Pounds, Has Sliding Gears and Shaft Drive

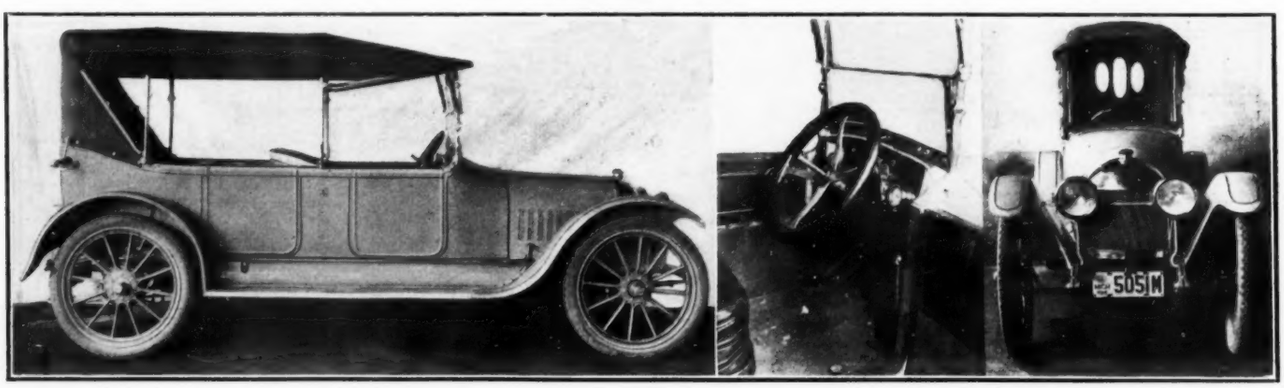
As an example of the refinement and finish to which the building of a small car can be carried, the little machine which Walter S. Marr, engineer of the Buick Motor Co., has made after his own ideas and for his own personal use is noteworthy. Although the Marr car was not built with the specific idea of manufacturing it for the public, if it were placed upon the market it would no doubt meet with ready sale. Its total weight is about 600 pounds.

The little car has a 36-inch tread, and 100-inch wheelbase. Its motor a four-cylinder water-cooled type 2 3-4 by 4 inches. The car is in every way up to standard in design, and has a sliding gearset and shaft drive back to a regulation type of rear axle with differential. The frame is of channel section pressed steel and springing is well taken care of by long semi-elliptics front and rear. Even the front axle is in accord with standard practice, for it is a small I-beam drop-forging with the usual form of yokes to carry the steering spindles.

Its body, an attractive little affair, is arranged for tandem seating. The cowl slopes into the bonnet and this meets the pointed radiator in unbroken lines. The radiator is finished in German silver. Finished in buff with brown leather upholstering to match, this little car would soon become the envy of many if it were on the streets of our cities, its price would be prohibitive unless made in large quantities, for it has every appointment that any machine can boast of.

Deep Turkish cushions are fitted, and the driver's compartment is roomy and comfortable. One special feature is the adjustable steering wheel which may be raised or lowered on its spindle to meet the requirements of the driver.

A speedometer and clock together with the spark and throttle levers are placed on the leather-covered instrument board, and at night they are lighted by an electric dash lamp. The control levers are at the right. Due to the narrow width of the car, the steering wheel is in the center.



Left—Side view of two-passenger tandem-seating car. Note top. Right—Driver's compartment and front view

Present Time Is Opportune for Increasing South American Trade

But We Must Go About Developing It Calmly and Sensibly, Prominent Speakers Tell Merchants' Association

NEW YORK CITY, Oct. 16—Nearly 1,000 business men assembled at the Hotel Astor on Wednesday at the call of the Members' Council of the Merchants' Assn. to consider the problem of extending our trade in South America. Many foreign consuls-general and representatives of the South American republics were present. The speakers were: W. S. Kies, manager of the foreign trade department of the National City Bank, which is establishing branches in the financial centers of South America; John R. Fowler, second vice-president of W. R. Grace & Co., and Charles M. Pepper, government expert on South American trade.

One of the most interesting addresses was that of Mr. Fowler on the present situation in South America. A brief digest of this follows:

"We commonly hear South America referred to as 'that country down there,' with no appreciation of the fact that it is really a great big continent, comprising quite apart from its three European colonies, ten distinct Nations, nearly all of very large area and no two of which are quite alike climatically, commercially or financially.

"Before the present war broke out, nearly all of South America was suffering from business depression and, of all the grand divisions of the world, apart from Europe itself, this sudden upheaval has struck South America the hardest blow and left those countries just bewildered. For they have always depended upon European money for government loans, public works, railway construction, industrial developments and all such enterprises.

Financial Troubles

"If we briefly review the countries, as before the war, we find that Brazil was already in a precarious financial situation, but expected relief from a large foreign loan which will not now come off. Her Amazon district is in a desperate condition from the low price of rubber. As to coffee, its market price has recently declined 30 per cent. to 40 per cent. and, moreover, she is temporarily without Europe as a taker of about 40 per cent. of her crop.

"Both Colombia and Venezuela suffer correspondingly in coffee, for which Hamburg formed a very important market.

"Argentine was in a critical commercial shape. She depends upon Europe as the main buyer of her great grain crops and also of her big wool clip.

"The great staple of Chile is nitrate of soda, of which article she produces about 3,000,000 tons annually. Of this Europe takes about 2,000,000 tons, so Chile has temporarily lost her market for two-thirds of the article, and this fact has quite demoralized that industry. Her copper industry is also afflicted.

"Peru is also a big producer of copper and suffers accordingly. She is helped by the big rise in sugar, but on the other hand, suffers from the fall in cotton.

"The principal export from Ecuador is cocoa, which has fallen about 33 1-3 per cent. in price, and is temporarily without Europe as a buyer.

Buying Power Crippled

"We must realize that the buying power of these South American countries has now been terribly crippled and will remain so for much time to come. Furthermore, all European export to South America is by no means shut off.

"In seeking trade relations, we usually overlook that barter is a good principle, and that hitherto our own Tariff might well be considered as 'in restraint of foreign trade.' Formerly, we tried to exclude everything that we absolutely had not to obtain abroad, but our new Tariff bill is something like an invitation to 'trade both ways,' and a sign that we are prepared to do more bartering.

"The present, therefore, is a particularly opportune time to develop our trade with South America; but we must go at it sensibly, earnestly and not hysterically.

"It is European capital that has always stimulated those countries, but if American capital can assist them in their present financial dilemmas our trade will be helped immensely, for it is money that keeps trade alive. And American money would naturally get us business where European capital has formed the habit of demanding a preference for European goods. Can we now help South America financially?

"Another circumstance, this time of a happier nature than war, is the compliment felt by the three leading South American nations upon being invited to join us in discussion of the International question of Latin America. And the elevation to the rank of Embassies of our diplomatic intercourse with Argentine, Brazil and Chile, is a new dignity offered by us to those countries, which is profoundly appreciated by them.

Liberal Credits

"We are often reproached on the score of niggardly credits to South American customers, but the fact is that our exporting merchants are really very liberal in credits to South America, much more so than our home merchants would concede to domestic trade. In spite of all we hear to the contrary, this affair of South American credit is just about the same whether the goods are from Germany, England or from the United States. For the worthy South American trader gets about the same facilities for payment, in one or another form, whether he buys from the United States or from Europe.

"The manufacturer properly wants cash to keep his business going, and it is the exporter who has to finance the foreign customer.

"It is always the unworthy customer that howls the loudest when the cautious merchant will not grant him dangerous terms; and this statement holds good whether the customer be in New York or Chicago, or Buenos Aires.

Shipping Facilities Good

"Perhaps it will surprise many to learn that our trade with South America is relatively as well served with shipping facilities as are the principal ports of Europe or Asia or Africa. In recent years, from New York alone, we have averaged fully three steamers weekly with general cargo to the River Plate ports, about semi-weekly to Brazil, and weekly to the West Coast by way of Magellan. In addition, the nearby countries have frequent service and the West Coast has had three lines connecting with us at Panama.

"And the ocean rates to ports 4,000 to 6,000 miles distant have been little, if any, more than we have to pay in domestic trade to ports only 600 or 800 miles away."

The Automobile

PUBLISHED WEEKLY

Vol. XXXI Thursday, October 22, 1914 No. 17

THE CLASS JOURNAL COMPANY
Horace M. Swetland, President
W. I. Ralph, Vice-President E. M. Corey, Treasurer
231-241 West 39th Street, New York City

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Entered at New York, N. Y., as second-class matter.
Member of the Audit Bureau of Circulations.
The Automobile is a consolidation of The Automobile (monthly) and the Motor Review (weekly), May, 1902, Dealer and Repairman (monthly), October, 1903, and the Automobile Magazine (monthly), July, 1907.

Demonstrations

DEALERS selling gasoline and electric trucks are still undecided as to whether it pays to demonstrate or not, in spite of the much valuable information that has been made public on this point. One large maker recently announced that when giving free demonstrations it made but one sale out of eighty-one demonstrations. Under a régime of charging for demonstrations it sold trucks to 87 per cent. of those to whom demonstrations were made. Under a régime of no demonstrations its business continued and made good increases.

Why should it be necessary to demonstrate a known quantity? We do not ask for demonstrations of new machines that we put in our factories or garages. When we buy them we expect that they will do certain work, otherwise we would not buy them.

Why should a central station company purchasing an electric truck ask for a demonstration, when its business is so closely allied with electric motors and batteries, the only two factors that might possibly give trouble in an electric machine. These same people do not buy electric generators on any principle of competitive demonstration, yet when it comes to buying a truck they expect, in fact, request, competitive demonstrations. They expect to get free demonstrations.

The $500 Electric

THE continued agitation from many quarters for a cheap electric passenger vehicle, one retailing in the zone of $500 or $700, does for the time being seem a conception but very little of a reality.

Practically every effort to date to produce such a vehicle has ended in signal failure, and those devotees of the electric, who have been refraining from purchasing until the $500 vehicle appeared, had better purchase if they want to derive any benefit during the next few years from the electric vehicle.

As to whether such a vehicle is a possibility of the semi-distant future is a matter of grave conjecture as there are so many apparently insurmountable obstacles to its achievement today as to make it a question of doubt as to whether such a vehicle will ever be built to meet the requirement of the public.

There are, in reality, two factors that render such a vehicle impossible today. First: It is practically impossible to build such a machine and make it meet the requirements of the people. An electric selling at $500 is not an impossibility to build but its radius of mileage on one battery charge would be limited to 25 or 30 miles and its speed would not exceed 15 miles. At the present time such a vehicle will not meet the requirements of our fastidious people. They want more mileage and they want more speed. Our cities today are too large in area for such a vehicle.

Electric manufacturers are apparently united in the one opinion that the public of today does not want such a vehicle, in fact, they say they have canvassed the makers of electric current in the leading cities, and that the majority of them would not make use of such a machine. Today the public is asking for increased mileage radius per battery charge, the radius of 50 or 60 not being enough, many asking for 85 and 100 miles per charge.

This demand for greater radius is not that such a mileage is used in the majority of trips, but the users want a feeling of confidence, a feeling that in the worst weather, when he needs his machine most, that he will have ample current and power to get him over his route and on schedule.

Quantity production has been the great secret of price reduction in the gasoline car field, and the doubting Thomases are asking why cannot similar reductions be accomplished in the electric. It may be possible, but at present the demand for such a vehicle does not seem large enough to warrant the investment that would be necessary to manufacture it on such a scale.

In the meantime gossip, and a few pioneering efforts, have set a high mark for the electric manufacturers to aim at; and, if it is true, that the existing electric of today with its large radius per charge, its long wheelbase, its reserve power and its luxurious equipment and furnishings can perform practically 98 per cent. of the work that the gasoline car does, it is only natural that the electric manufacturers push to the limit their present product which has been developed to meet the demands of the public.

Advocate Michigan Law for All States

Committee on Uniform Automobile Regulation Considers Statute at Present Void Most Suitable for Adoption

WASHINGTON, D. C., Oct. 17—One of the big subjects to be discussed by the delegates to the conference of commissioners on uniform state laws, now in session here, is a uniform motor car law, which has been prepared by a special committee. The committee has adopted the statute in force in Michigan as the basis for the model law it proposes that the conference shall indorse and recommend to the legislatures to pass in all the states.

It is a lengthy bill and provides for the registration, identification, regulation and taxation of motor vehicles operated upon the public highways and of the operators of such vehicles. Some features of it are the furnishing of registration lists to county clerks; re-registration annually; changing of color of number plate annually; special registration by manufacturers and dealers; exemption of non-resident owners other than corporations; registration of chauffeurs and wearing of chauffeur's badge; unregistered chauffeurs not permitted to drive; certifying convictions of violation of law, etc.

The report of the committee on the proposed uniform law is in part as follows:

The reason for adopting the statute of another state as the basis of a uniform law loses some of its force from the fact that this Michigan statute was held to be unconstitutional by the supreme court of that state in March, 1914, which decision is reported in Vernor against Secretary of State, 146 N. W., 338.

However, upon inspection of this decision it will be found that there is no fault in the body of the act, but its invalidity was placed upon the ground that under the constitution of Michigan the title of a statute must clearly indicate the purpose of law, which the title to this act failed to do, it providing only for "registration, identification and regulation of motor cars" under the police power of the state, when it was, in fact, a taxation measure under the taxing power of the state. However, this defect of the statute is remedied by broadening the title to cover the subject matter of the law, which your committee has done in the proposed bill, so that it may meet the requirements of the constitutions of the several states which have provisions similar to that of Michigan.

Michigan Will Re-Adopt Law

That the Michigan statute will be re-adopted by that state, with perhaps some slight modifications, is the opinion of the chairman of this committee, who is a resident of Michigan, and the tentative action taken by this conference may be of benefit to the legislatures of the several states, including the state of Michigan, who may be called upon to act in the adoption or amendment of motor car statutes in the coming year.

While we have presented the Michigan act in its entirety, we are not in favor of the adoption of all of its provisions and have placed footnotes to some of its sections, indicating our view in relation thereto.

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Bankers Recognize Automobile Industry

RICHMOND, VA., Oct. 17—Worthy recognition of the automobile industry was furnished at the annual meeting of the American Bankers' Assn. here recently in an address by William Livingstone, president of the Dime Savings Bank of Detroit, on "Twelve Years of Continued Progress—the True Status of the Automobile Industry" in which for the first time at one of these bankers' gatherings there were favorable words for the automobile, its builders and users.

There were more than 2,000 bankers from practically every state at the meeting in Richmond. Alfred Reeves, General Manager of the National Automobile Chamber of Commerce, was also present to supply any facts and figures that might be required.

Mr. Livingstone showed that there were more than 435,000 cars sold during the year ending June 30, and that even in depressed times there had been continued buying of cars, supplying proof that they are a growing necessity of our modern civilization. Bankers had fostered a growing industry through co-operation with manufacturers and dealers and he explained in detail the method of making and marketing cars. Not alone did he furnish figures for the past but he indicated the future fields for the motor car and the possibility of increasing the sales both here and abroad.

Among the interesting figures brought out by the Detroit banker was the fact that there are 1,400,000 cars in use in this country, with an approximate figure of 450,000 cars as a production for the next 12 months to be sold by 15,500 automobile dealers. He said there were 13,630 garages; 1,280 repair shops and 680 supply houses. There are 450 listed manufacturers of motor vehicles, including 170 making gasoline pleasure cars; 245, gasoline commercial cars; seventy-seven, light cars; twenty-seven, motor fire apparatus; eighteen, electric pleasure cars; twenty-four, electric commercial vehicles.

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Willys-Overland Business Breaks Records

TOLEDO, O., Oct. 21—*Special Telegram*—To show that the war is not affecting the automobile business to the extent some people claim, the Willys-Overland Co. reports that the week ending October 17 was biggest in its history, 1,400 cars valued at more than $1,300,000 being shipped, exclusive of trucks, etc.

October 15 unfilled orders for cars for $4,500,000 were on hand, one-third increase over the corresponding day last year.

Since the start of the fiscal year in July 11,400 cars have been shipped up to October 15, or 40 per cent. more than the corresponding period last year and 500 per cent. increase over 2 years ago.

Average daily shipments are 250 cars, men being employed and in some departments work is kept up 24 hours.

Since July 1 sales abroad are 75 per cent. of what they were in the same period a year ago, while average daily shipments to foreign countries represent in value $10,000.

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Sales Good at N. Y. Electrical Show

NEW YORK CITY, Oct. 20—Not only has the present electrical show held at Grand Central Palace been more of a success than was anticipated, considering present financial conditions, but it has actually been the cause of more sales than any previous show. This is the consensus of opinion as expressed by the exhibitors of electric automobiles, and accessories. More people have attended the show, more interest has been shown in the displays than heretofore, more prospects have been obtained, and more sales actually closed.

As an example, one concern sold eleven electric pleasure cars. Strange to say, the war was given as a reason for practically all of these sales. It was stated that most of these machines were bought by the ultra-rich, those who were accustomed to drive the largest cars and employ the most expensive chauffeurs. Financial stringency forced those people to economize with the result that the chauffeurs were discharged, the big cars sold and electrics purchased, the need for chauffeurs not being so urgent in the operation of electrics.

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Vanderbilt and Grand Prize Cups Offered

NEW YORK CITY, Oct. 19—The Motor Cups Holding Assn. has granted permission to the Panama-Pacific officials to put up both the cups for the Vanderbilt and Grand Prize races on February 22 and March 7, respectively. Up to the present time no official sanction has been given by the A. A. A. or the A. C. A., but it is expected that now, that the Motor Cups Holding Assn. has given its permission to hang up both cups, both sanctions will be forthcoming.

According to present plans the Vanderbilt race will be for automobiles of 600-inch piston displacement, or less, the minimum weight to be 1,600 pounds. The distance to be covered will be 300 miles. Cash prizes have been offered in addition to the cup. The winner will receive $3,000; second, $2,000; third, $1,500; fourth, $1,000, and fifth, $500.

The Grand Prize distance is 400 miles. Cash prizes will also be awarded in addition to the cup, donated by the Automobile Club of America. The winner will receive $3,000; second, $2,000; $1,000 to third, $1,000 to fourth and $500 to fifth.

The entry fee covering both races is $250. Entries close at midnight, February 10, 1915.

Barney Oldfield has expressed his desire to enter both races. He will drive a Stutz. Up to the present time no official entry has been made.

Exports for Fiscal Year Total $40,000,000

Remarkable Decrease in August Following Outbreak of War

Exports Falling to 451 Cars

WASHINGTON, D. C., Oct. 19—At the request of many American motor car manufacturers the bureau of statistics, Department of Commerce, today made public figures showing the distribution of American automobiles, both pleasure and commercial, together with parts, during the fiscal year ended June 30, 1914. In that period outward shipments, including automobiles, engines, tires, parts, etc., reached the high record total of $40,000,000. It is noted, however, that a remarkable decrease occurred in August following the outbreak of war in Europe, exports in that month having fallen to 451 automobiles and motor trucks, compared with 2,004 in August of last year.

The following statement contains a complete record of the exports of motor trucks and passenger vehicles in the year ended June 30, 1914:

	Commercial Motor Vehicles		Passenger Automobiles		†Parts
	Number	Value	Number	Value	Value
Exported to					
Europe	249	$248,716	13,108	$10,168,218	$1,830,560
England	203	189,099	6,992	5,615,487	1,282,388
Germany	24	18,462	1,411	1,040,787	213,351
France	2	5,070	1,427	919,060	179,351
Russia	2	5,322	926	898,458	14,079
Sweden	1	900	324	253,588	6,140
Italy	1	1,229	342	241,466	50,580
Austria-Hungary	3	7,455	314	190,199	5,198
Denmark	..	..	263	176,947	8,664
Belgium	..	..	244	139,681	20,978
Norway	2	3,852	145	118,338	1,893
Netherlands	1	1,452	141	117,131	7,634
Finland	..	..	106	83,835	2,931
Portugal	8	12,075	59	65,545	2,357
Spain	..	..	83	64,758	6,266
Scotland	..	..	25	46,948	23,269
Switzerland	..	..	79	56,838	1,069
Other Europe	2	3,800	227	139,152	4,412
North America	298	558,413	5,190	6,280,042	3,847,616
Canada	247	474,724	4,377	5,445,052	3,663,879
Cuba	19	33,500	297	254,428	48,217
Mexico	12	17,509	155	239,166	41,508
Central Am. Reps.	13	17,814	118	123,155	28,390
British W. Indies	4	11,250	140	133,935	44,411
French W. Indies	..	..	65	48,377	8,099
Other North Am.	3	3,616	38	35,929	13,112
South America	79	130,811	1,906	1,808,401	296,306
Argentina	48	65,225	940	963,586	92,633
Brazil	13	20,449	299	264,992	84,602
Chile	2	10,743	195	160,194	22,405
Uruguay	1	865	183	167,269	21,401
Venezuela	12	28,228	126	102,073	36,286
Colombia	..	..	79	69,620	19,970
Peru	3	5,301	36	31,362	5,982
Ecuador	..	..	21	21,229	6,324
Bolivia	..	..	4	12,764	1,209
British Guiana	..	..	16	11,364	4,583
Dutch Guiana	..	..	7	3,948	911
Asia	30	55,658	1,408	1,206,031	144,017
India	7	12,091	437	379,954	47,923
Straits Settlements	7	14,381	262	216,659	25,100
Dutch E. Indies	7	14,232	290	208,722	15,368
China	7	12,700	144	143,619	5,825
Japan	1	900	96	101,195	35,637
British E. Indies	..	..	82	73,175	4,099
Siam	..	..	37	26,219	4,905
Aden	..	..	28	20,990	1,676
Hongkong	..	..	11	13,043	626
Russia	..	..	12	14,998	..
Turkey	1	1,354	7	5,662	67
Chosen (Korea)	..	..	2	1,795	2,791
Oceania	113	171,407	4,833	4,338,977	334,956
Australia & Tas'ia.	32	37,378	3,099	2,615,896	202,363
New Zealand	39	61,599	1,065	974,708	53,644
Philippine Islands	38	64,805	614	697,175	69,933
French Oceania	4	7,625	46	45,184	7,560
British Possessions	..	..	9	6,014	1,060
German Oceania	..	..	..	..	396
Africa	15	16,606	1,861	1,591,294	170,777
British S. Africa	12	11,539	1,618	1,437,883	157,264
British S. Africa	12	11,539	1,618	1,437,883	157,246
British W. Africa	1	1,260	32	18,319	5,743
French Africa	..	..	19	17,273	200
German Africa	..	..	19	14,136	999
Morocco	..	..	63	29,297	166
Portuguese	1	2,604	24	21,563	1,585
Egypt	..	..	22	11,437	130
Canary Islands	1	1,203	15	6,956	1,505
Grand total	784	$1,181,611	28,306	$25,392,963	$6,624,232
Shipped to Hawaii	*..	*..	701	841,458	85,813
Shipped to P. Rico	*..	*..	291	320,680	70,025
Shipped to Alaska	*..	*..	54	60,930	7,505

*Automobiles of all kinds included under "passenger."
†Exclusive of tires and engines.
Note—Under all other Europe are included: Greece, 1 commercial, $1,800; 25 passenger, $28,256; Turkey, 1 commercial, $2,000; 35 passenger, $21,052; also the following passenger automobiles: Azores and Madeira, 20, $10,771; Bulgaria, 43, $21,679; Gibraltar, 64, $33,030; Iceland, 5, $2,488; Malta, etc., 1, $422; Roumania, 28, $17,018; Servia, 4, $2,843; and Ireland, 2, $1,598. Under other North America, Newfoundland, 1 commercial, $1,221; 5 other, $2,761; Dutch West Indies, 1 commercial, $595; 13 other, $9,605; Santo Domingo, 1 commercial, $1,800; 11 others, $15,195; and a total of 9 passenger cars valued at $8,368 to British Honduras, Haiti and the Danish West Indies.

Market Reports for the Week

Market prices this week were generally lower, especially in the metals markets. Extreme dullness continues for refined copper and the tone of the market is easier, yet with scarcely enough business to indicate the exact position of prices. Electrolytic, though coming down $0.00 1-5, remained constant at $0.11 3-20 per pound, from Thursday on. Antimony is active and strong at $0.10 1-2. Tin had a fluctuating week of it, with a drop of $0.25 per 100 pounds. Only moderate buying is reported, and that by domestic consumers. Lead was quiet but steadier. The oils and lubricants markets were more or less steady, with a few drops in prices. Linseed oil came down to $0.47 at a drop of $0.02 while cyanide potash dropped to $0.25 per pound at a loss of $0.03. Cottonseed oil closed at $5.10 a barrel, or $0.18 below the opening price. Fine Up-River Para rose to $0.66 at a gain of $0.02. A fair demand is reported for crude rubber and the market was firmer in tone, especially for Brazilian, supplies of which are reported to have diminished recently.

Material	Wed.	Thurs.	Fri.	Sat.	Mon.	Tues.	Week's Changes
Antimony	.10½	.10½	.10½	.10½	.10½	.10½	.....
Beams & Channels, 100 lbs	1.26	1.26	1.26	1.26	1.26	1.26	.....
Bessemer Steel, ton	19.50	19.50	19.50	19.50	19.50	19.50	.....
Copper, Elec., lb	.11 7/20	.11 3/10	.11 3/20	.11 3/20	.11 3/20	.11 3/20	—.00½
Copper, Lake, lb	.11½	.11½	.11⅝	.11⅝	.11⅝	.11⅝	+.00⅛
Cottonseed Oil, bbl.	5.28	5.15	5.15	5.15	5.15	5.10	—.18
Cyanide Potash, lb.	.28	.28	.28	.28	.28	.25	—.30
Fish Oil, Menhaden, Brown	.40	.40	.40	.40	.40	.40	.....
Gasoline, Auto, bbl.	.13	.13	.13	.13	.13	.13	.....
Lard Oil, prime	.92	.92	.92	.92	.92	.92	.....
Lead, 100 lbs	3.50	3.50	3.50	3.50	3.50	3.50	.....
Linseed Oil	.49	.49	.49	.49	.49	.47	—.02
Open-Hearth Steel, ton	19.50	19.50	19.50	19.50	19.50	19.50	.....
Petroleum, bbl., Kans., crude	.55	.55	.55	.55	.55	.55	.....
Petroleum, bbl., Pa., crude	1.45	1.45	1.45	1.45	1.45	1.45	.....
Rapeseed Oil, refined	.82	.82	.82	.82	.82	.82	.....
Rubber, Fine Up-River, Para	.64	.64	.64	.64	.64	.66	+.02
Silk, raw, Ital	..	4.40	..	..	4.30	..	—.10
Silk, raw, Japan	..	3.38	..	..	3.15	..	—.23
Sulphuric Acid, 60 Baume	.90	.90	.90	.90	.90	.90	.....
Tin, 100 lb	29.25	28.50	28.50	28.75	28.75	29.00	—.25
Tire Scrap	.05	.05	.05	.05	.05	.05	.....

Clayton Trust Bill Becomes a Law

WASHINGTON, D. C., Oct. 16—President Wilson signed the Clayton Trust Bill Thursday, Oct. 15. Two sections affect merchandising interests. One prohibits discrimination in price between purchasers when such discrimination tends to lessen competition or create monopoly. This section, however, permits grade, quality and quantity discriminations and permits price differences due to difference in selling or transportation costs. In the same community discrimination is permitted if made in good faith to meet competition. The seller is also permitted to select his own customers or dealers, when not in restraint of trade.

Another section prohibits the selling, leasing or fixing the price on any manufactured article on condition that the buyer or lessee shall not use or deal in a rival product. Interlocking commercial directorates are forbidden and no director, after the act has been in effect two years, shall be a director in two or more corporations any one of which has stock, surplus and undivided profits of more than $1,000,000.

Directors in offending corporations may be fined $5,000 or imprisoned.

Claims Infringement on Tire Cover Patent

NEW YORK CITY, Oct. 19—The Allen Auto Specialty Co., New York City, filed suit this week in New York against E. G. Baker, charging infringement of the Benjamin Nathan tire cover patent No. 799,662. Baker, who is located in the United States Rubber building, is a representative of the Gilbert Mfg. Co., New Haven, Conn., a tire cover maker.

Packard Production Passes 25,000 Mark

3,612 Vehicles Built in Company's Fiscal Year— Complete Balance Sheet

DETROIT, MICH., Oct. 15—With the ending of the fiscal year of the Packard Motor Car Co., August 31, 1914, another event took place in the concern's history. It was the passing of the 25,000 mark as far as the production of Packard motor cars and vehicles is concerned, for on that day exactly 25,028 Packards of all kinds had been built, during the 11 years the veteran company has been in the business.

Less cars were made during the business year just ended, all told, 3,612, which is 382 below the Packard record production of the previous 12 months. The Packard production, year by year since it started manufacturing was as follows:

1903-4—192	1907-8—1,470.	1911-12—3,617.
1904-5—481.	1908-9—2,669.	1912-13—3,994.
1905-6—768.	1909-10—3,990.	1913-14—3,612.
1906-7—1,188.	1910-11—3,047.	

Referring to an increase in the common stock a year ago the report says:

"At the annual meeting of the company a year ago, an increase in the common capital stock from $5,000,000.00 to $8,000,000.00 and of the preferred capital stock from $5,000,000.00 to $8,000,000.00 was authorized by the stockholders. This increase in authorized capital stock was made by reason of contemplated steps, some of which, on account of the generally depressed condition of American industry, have been postponed or abandoned, at least for the present, and we have been able to provide funds for our necessities, such as additional machinery, shop charges, experimental model development, etc., in the ordinary course of the business of the company, in preference to the payment of dividends on the common stock.

"So therefore no additional issue of the increased preferred stock thus authorized at the last annual meeting has been made. None of the increased common stock authorized has been sold except to a small extent, actually only $65,300.00, which the stockholders to whom the offering was necessarily made according to law had a perfect right to and did avail themselves of their privilege to subscribe for at par. All the other stockholders of the company, at the request of the managing officers, refrained from subscribing to this common stock, leaving it a treasury asset and available for the future wants of the company in the discretion of the directors.

"The directors, however, did feel that the common shareholders had a right to have represented in common stock in their possession a reasonable part of the surplus accumulated in past years, which on August 31, 1913, amounted to $3,006,256.22, and therefore in October, 1913, they distributed to the common shareholders $2,000,000 of the common capital stock from the $3,000,000 of common capital stock provided at the annual meeting last year, and thus decreased the accumulated surplus to that extent."

The annual statement, given in brief in THE AUTOMOBILE last week, shows the total receipts for the fiscal year ending August 31, 1914, to be $14,295,238.25, as against total disbursements of $11,832,773.80, leaving cash on hand on that date $2,462,464.25. The complete balance sheet follows:

ASSETS

PLANT: AT COST LESS DEPRECIATION—		
Real Estate—at cost	$285,864.21	
Buildings	2,140,259.05	
Machinery	1,094,754.36	
Equipment—Boilers, Engines, Generators, Motors, Elevators, Shafting, Etc.	979,774.39	
Fixtures, including Office Furniture	307,475.94	
Tools	672,011.95	
Construction work in progress	16,881.81	
Development, drawings, patterns, models, etc.	342,438.58	
Rights, Privileges, Franchises and Inventions	1,001.00	
Total Plant—At Cost less Depreciation		$5,840,461.29
Investment in Branch Selling Companies		1,515,288.87
INVESTMENTS—		
Bonds and Other Short Time Securities	$238,462.50	
Stock—Kardo Company	10.000.00	
Total Investments		248,462.50
Stock Option Contracts with Employes		201,950.00
INVENTORIES—		
Raw Material, Work in Process and Finished Vehicles		6,394,864.56
CURRENT ASSETS—		
Cash	$2,462,464.45	
Vehicles in Transit to Dealers, Covered by Draft	278,309.26	
Vehicles in Transit to Branches and Accounts of Branches, not due	263,146.11	
Accounts Receivable	138,196.16	
Bills Receivable, Dealers	55,893.61	
Bills Receivable, Branches	467,500.00	
Total Current Assets		$3,665,509.59
Expenses Paid in Advance		97,083.81
Total		$17,963,620.62

LIABILITIES

CAPITAL STOCK—AUTHORIZED AND ISSUED—		
Common—		
At beginning of year, 50,000 shares of $100.00 each	$5,000,000.00	
Authorized October 16th, 1913, to be Distributed to Common Stockholders 20,000 shares at $100.00 each	2,000,000.00	
Issued to and Paid for at par by Stockholders, 653 shares of $100.00 each	65,300.00	
A total outstanding of 70,653 shares of $100.00 each		$7,065,300.00
Leaving in the Treasnry, 9,347 shares of $100.00 each	$934,700.00	
A total Authorized Issue of 80,000 shares of $100.00 each	8,000,000.00	
Preferred—		
7% Cumulative at beginning of year, 50,000 shares of $100.00 each	$5,000,000.00	5,000,000.00
Authorized October 16th, 1913, and now in hands of Treasurer, 30,000 shares of $100.00 each	$3,000,000.00	
A Total Authorized Issue of 80,000 shares of $100.00 each	8,000,000.00	
Five per cent Gold Debenture Notes—Due December 1st, 1916		3,000,000.00
Accounts Payable—		
Invoices, Accrued Pay Roll, Vouchers not due, Deposits on Vehicles, Orders, etc.		886,780.98
Reserves for General Purposes		213,719.22
Surplus—		
As at August 31st, 1914, after deducting Depreciation of Plant Assets and Paying all Expenses of the Business and Interest on Debenture Notes, or Setting Aside Proper Reserves to Cover Same, and after Paying the Regular Dividends on Preferred Stock and a Special Distribution of Common Stock of the Company		1,797,820.42
		$17,963,620.62

Voiturette Creditors Approve $100,000 Offer

DETROIT, MICH., Oct. 20—At a meeting of the creditors of the bankrupt American Voiturette Co., they approved of the offer of $100,000 cash which has been made by the Samuel L. Winternitz Co., Chicago, for all the property excepting real estate, accounts, notes and cash. The receiver, the Detroit Trust Co., has petitioned Judge Tuttle, of the United States District Court, to allow the sale to take place.

According to reports, it is the intention of the Winternitz company to continue the manufacture of the Car-Nation and Keeton cars.

Chalfant Is Secretary of Electric Makers

NEW YORK CITY, Oct. 21—E. P. Chalfant has been appointed secretary of the Electric Automobile Manufacturers Assn., an organization of makers of electric passenger vehicles. Mr. Chalfant will open a general office in Chicago and devote his entire efforts to the interest of this organization which has been in existence for several years. At present the membership includes such manufacturers as Anderson, Baker, Ohio, Rauch & Lang, Waverley and Woods. It is expected that the membership will soon be more than doubled.

Mr. Chalfant is well known to the automobile industry in that he was general manager of the Assn. of Licensed Automobile Manufacturers 1908-1909. He was general sales manager for the Packard company during the next 2 years and from that company went to the Thomas Motor Car Co.

E. V. A. A. Elects Officers and Directors

PHILADELPHIA, PA., Oct. 21—The annual election of officers for the Electric Vehicle Assn. of America was held in this city today at the completion of the Fifth Annual Convention of the Association. The officers elected were: President, J. F. Gilchrist, Chicago; vice-president, Walter H. Johnson, Philadelphia; treasurer, H. M. Edwards, New York. Four new directors were elected as follows: F. W. Smith, New York; C. Blizard, Philadelphia; E. P. Chalfant, Chicago; and J. H. McGraw, New York. Of these officers, practically all are representatives of central station interests except Charles Blizard, of the Electric Storage Battery Co., and Mr. McGraw, the New York publisher.

175 Cars on View at Pittsburgh Show

First Fall Display Opens —75 Accessory Exhibitors —Good Business Done

PITTSBURGH, PA., Oct. 20—The ninth annual show of the Automobile Dealers' Assn. of Pittsburgh, Inc., is on at the Motor Square Garden, East End, this week. This is the first fall exhibition of automobiles in this city. More cars are being shown than ever before in this city and fully 175 individual cars are on display. There are also seventy-five displays of automobile accessories. Limousines and other inclosed types predomniate.

The exhibits in general emphasize the predominance of electric equipment for starting and lighting, the popularity of the six cylinder car, the appearance of the first American eight-cylinder car, the increasing number of makes using wire wheels, the big gains in safety appliances, the using of demountable rims on all cars and the prevalence of the left hand drive. About four-fifths of the cars are gasoline propelled. The show occupies about 30,000 square feet of space and exhibits are estimated at over $1,000,000.

The show is in charge of Ray P. McAllister and Earl Kiser. Sales of new models were nearly or quite as large as last year and in second-hand cars a better business was done.

Boston to Have Another Electric Show

BOSTON, MASS., Oct. 17—Boston is to have another Salon at which electric cars exclusively will be displayed. Plans have been completed for a 5 days' show at the Copley Plaza Hotel beginning November 2nd and ending the 6th. Already space has been alloted to fourteen different makes, and applications are pending from ten or twelve more. This will make it a larger electric show than the first one which was held at the same place a year ago.

Non-Members Apply for Show Space

NEW YORK CITY, Oct. 19—The National Automobile Chamber of Commerce, Inc., has on hand many applications to exhibit at the New York and Chicago shows, from accessory companies, which are not members of the accessory organization. There are eighty-five applications from such concerns for the New York show and fifty-six for the Chicago show. Additional applications are being received every day, and it is expected that allotments of space to these exhibitors will be made in a week or 10 days.

To Form the Associated Garages of America

CHICAGO, ILL., Oct. 19—A call has been issued by the Garage Owners' Assn. of Illinois for a convention to be held in this city during the automobile show in January, on the 27th and 28th, for the purpose of forming an organization on broad national lines. The name suggested for the new body is the Associated Garages of America.

The national convention will tread on the heels of the Illinois State Convention. The latter is called for January 26.

Seven New Members for M. & A. M.

NEW YORK CITY, Oct. 19—At a recent meeting of the Board of Directors of the Motor and Accessory Manufacturers, the following named concerns were elected to membership:

The Bearings Co. of America, manufacturer of ball bearings, universal joints, etc., Lancaster, Pa.; the Bock Bearing Co., manufacturer of Bock taper roller bearings, Phillips avenue and Michigan Central Railroad, Toledo, O.; Dreadnaught Tire & Rubber Co., manufacturer of automobile pneumatic tires, Munsey Building, Baltimore, Md.; Golde-Patent Mfg. Co., manufacturer of automobile tops, windshields, and other supplies for automobiles and carriage trade, 509-515 West Fifty-sixth street, New York City; L. P. Halladay Co., manufacturer of shock absorbers, bumpers, ignition devices and small specialty, Streator, Ill.; Robert H. Hassler, manufacturer of shock absorbers, West Tenth and Canal streets, Indianapolis, Ind., and Sloan & Chace Mfg. Co., manufacturer of a device combining air cranking and compressing to be sold by The Motor-Compressor Co., corner Sixth avenue and Thirteenth street, Newark, N. J.

Wilson Co. Announces New Truck

DETROIT, MICH., Oct. 19—The J. C. Wilson Co., long identified with the vehicle business of the city, and since the inception of the automobile, being principally associated with the automobile painting and trimming field, has made public the details of its 1 1-2-ton motor truck which has been in the process of experimentation and development for several months. The price is set at $1,800.

Construction of the first lot of trucks is now under way at the plant at Cass and Adams streets which is to be given over to this branch of the concern's business, the painting and trimming business being carried on at the Fifteenth street and Warren avenue plant, as heretofore.

The motor is a four-cylinder Continental, 4 1-8 by 5 1-4, of L-head type, and with cylinders cast in block. It is suspended in the chassis at three points. It drives back through a 1 3-4-inch tubular shaft to the gearset bolted to the jackshaft. Substantial gears having a face width of 1 inch are used in the gearset, and afford three selective speeds.

The design is conventional throughout with the exception that there are no brakes placed on the jackshaft, both service and emergency sets being located on the rear wheels. By eliminating jackshaft brakes, any strain on the jackshaft and chains, due to stopping, is cut out.

Metropolitan S. A. E. to Meet Oct. 29

NEW YORK CITY, Oct. 21—The Metropolitan Section of the Society of Automobile Engineers will meet on October 29 at the Automobile Club of America, where Professor W. C. Marshall will present a paper on Dr. A. Riedler's work and his book on "The Scientific Determination of the Merits of Automobiles." Prominent engineers will give their opinions.

Find Lozier Assets $4,912,717.97

DETROIT, MICH., Oct. 19—The inventory taken by the Detroit Trust Co., receiver for the Lozier Motor Co., shows assets valued at $4,912,717.97 which are appraised at $2,069,-718.50 on the basis of a "going concern," while under "liquidating" circumstances the value would be $1,366,584.46. In this last named value the real estate, buildings, power house machinery and equipment of the plant in Detroit and the one in Plattsburg, N. Y., is not taken into consideration.

The total value of the liabilities is placed at $6,709,141.88 more than half of which, $3,494,700 is capital stock, $2,602,-668.11 unsecured claims, $241,054.17 secured liabilities and $370,736.63 contingent liabilities.

With the completion of the inventory of the Lozier Motor Co., by the receiver, the Detroit Trust Co., the results will be submitted to Judge Tuttle, of the United States District Court, who will decide upon the future course to be taken.

Prominent men in the automobile business were among the appraisers selected by the receiver to help it in making the inventory. Among these men were Henry M. Leland, president and general manager of the Cadillac Motor Car Co.; C. A. Pfeffer, treasurer of the Chalmers Motor Co.; G. H. Kleinert, factory manager of the Chevrolet Motor Co.; Richard E. Baus, assistant production manager of the Studebaker Corpn.

Receiver for Premier Motor Mfg. Co.

INDIANAPOLIS, IND., Oct. 19—A number of creditors of the Premier Motor Mfg. Co., Indianapolis, Ind., filed a petition in the United States court on Saturday, October 7, asking that a receiver be appointed and that the company be adjudged bankrupt. In the absence of Judge Albert B. Anderson, the matter was referred to Albert Rabb, referee in bankruptcy, who set November 2 as the time when the Premier company should appear and show cause why the action asked for, should not be taken. On Saturday Mr. Rabb appointed Frank E. Smith, formerly of the American Motors Co., receiver.

The petition is signed by three companies with small claims. They allege the company is insolvent and that while insolvent it preferred certain creditors.

In the Marion County Circuit Court Friday, October 15, Judge Charles Remster appointed the Fletcher Savings and Trust Co. and F. Barnickol, treasurer of the company, receivers for the Premier company on a suit brought by one company which claims there is due to it $1,691.75 for merchandise and that the Premier company is in danger of insolvency and that creditors are threatening to bring action.

The court authorized the receiver to borrow $10,000 and to

continue the business for 10 days. At the expiration of that time, the court will determine what further action shall be taken toward continuing the business.

In the complaint, it is alleged that the Premier company has a total indebtedness of about $400,000, that there is outstanding $320,000 in preferred stock and $100,000 of common stock. It is further alleged that the book assets, which are in excess of actual value, are insufficient to discharge liabilities to the stockholders; that there is much indebtedness past due and no present means of discharging or caring for any part of this indebtedness.

The plaintiff asks that the receiver be authorized to complete cars under process of construction and to sell these and all completed cars on hand as soon as a reasonable price can be obtained for them.

In November, 1913, the capital stock of the Premier company was increased from $1,250,000 to $1,750,000, at which time a number of creditors were tendered new preferred stock in lieu of cash in settlement of their claims. The following week, a number of new men entered the directorate of the company, making the personnel of the board as follows: F. Barnickol, C. O. Baxter, A. L. Reeves, Clarence Stanley, H. O. Smith, Timanus J. Wilson and G. A. Weidely.

Firestone Convention Closes—Big Success

AKRON, O., Oct. 19—Over 250 representatives of the Firestone Tire & Rubber Co., this city, attended the sales conventions of that company on October 14 and 15. The attendance was so large that the conferences could not be held in the old Convention Hall, it being necessary to hold them in one of the partially finished additions to the Firestone factory.

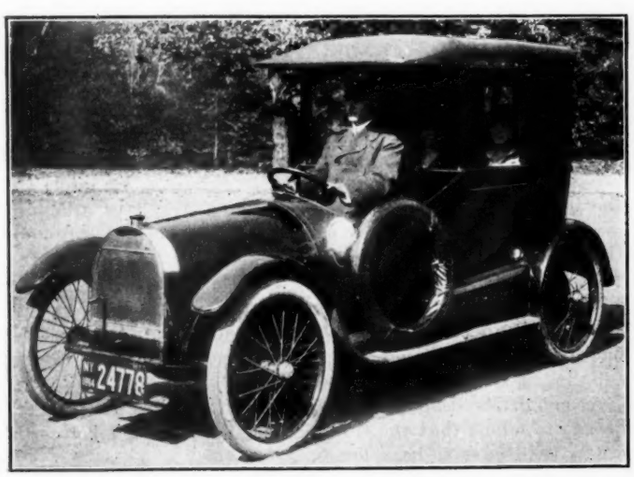
The company, at their recent annual meeting, announced a 78 per cent. increase in output over the previous fiscal year. All departments have been crowded to more than capacity in order to take care of this additional business and the new additions, now nearing completion, will add a total of 96,800 square feet to its floorspace.

The convention officially closed with the banquet at the Portage Hotel, but many of those in attendance remained until Saturday.

Twombly Taxicab Sells for $600

NEW YORK CITY, Oct. 21—Taxicab transportation at the rate of 20 cents per mile is promised by the Twombly Car Corp., Nutley, N. J., which has announced a taxicab to sell for $600. It is stated that within a few months a fleet of these vehicles will be operating in New York, the charge for the first mile being 25 cents and for each additional quarter, 5 cents. It is to carry two people. According to the terms of the contract, the purchaser of one of these cabs cannot charge more than 25 cents per mile.

The body is a landaulette type with the roof extending well over the driver's seat, the driver being located directly in the center of the vehicle. The wheelbase is 100 inches and the tread 44. The car weighs only 1,400 pounds. The motor is an L-head design with four cylinders 2.75 by 4 inches, and rated at 12 horsepower. It is water-cooled and lubricated by a combination splash and force-feed system. A three-speed sliding gearset is located on the rear axle; and drive from the motor is accomplished by means of a chain located on the left.



Twombly taxicab which buyers must operate at 25 cents per mile

900-Mile Race Planned—El Paso to San Diego

If Sanctioned, Contest Will Be Held in January or February

NEW YORK CITY, Oct. 16—Application for a sanction to hold a 900-mile Panama-California Exposition road race between El Paso, Tex., and San Diego, Cal., has been made to the Contest Board of the American Automobile Assn.

The San Diego Automobile Racing Assn., which guarantees to furnish a $10,000 purse for the contest, filed the application. It is planned to have the race start in El Paso some time during January or February.

This will be the longest automobile race ever run, barring the round-the-world race won by the Thomas car, and exceeds in distance the Paris-to-Berlin and to Madrid contests.

With the San Diego race added to the Grand Prize, Vanderbilt, Panama-Pacific, Los Angeles-Phoenix, El Paso-Phoenix and the Corona cup contests, the Pacific Coast will this year be the Mecca of automobile racing.

Classification of R-C-H Creditors Confirmed

DETROIT, MICH., Oct. 17—In the bankruptcy court an order was signed yesterday confirming the proposed classification of creditors of the defunct R-C-H Corp., as submitted by the trustee, the Security Trust Co.

According to this decision creditors with claims aggregating $1,365,610.01, who had signed an extension agreement October 25, 1912, will receive nothing whatever on their claims as the debts arising after that date will not be paid.

Referee in Bankruptcy Lee E. Joslyn has called a meeting of creditors for November 4, at which time a dividend of from 10 to 20 per cent. will be declared on the claims which accrued after October 25, 1912, and which amount to $275,773.72. The Trust company is preparing to disburse from $60,000 to $70,000 for these dividends.

Under the schedule submitted by the trustee as confirmed by the court, the deposits of agents aggregating $76,560.45 will be treated only as general claims and will receive about 10 per cent. in dividends.

Certain creditors who have filed objections to the classification will have their claims determined at a later date.

It is estimated that those creditors who sold goods to the defunct corporation after the extension agreement will receive about 65 per cent. of their claims.

The thousand creditors affected by the bankruptcy court order may appeal from this order any time up to October 31, 1914.

Disco Enters Electric Starter Field

DETROIT, MICH., Oct. 18—With a capital stock of $60,000 and an entirely new organization, the Disco Electric Starter Co., has just been organized succeeding the American Electric Starter Co., which itself had absorbed the old Disco company. The new concern's incorporators are Jacob and Henry J. Dornbus, of Grand Rapids, Mich., and Charles J. Carpenter of this city, while the officers are Jay Johnson, president; Charles J. Carpenter, vice-president and T. D. Murton, secretary-treasurer. Mansell Haskett, who has been with both of the former concerns is general manager of the new works. The company will manufacture a new electric starter at its plant on Jefferson avenue and Leib street.

Petition Filed Against Overman Co.

NEW YORK CITY, Oct. 20—A petition in bankruptcy was filed against the Overman Tire Co., Inc., with salesrooms at 1853 Broadway and factory at 250 West Fifty-fourth street by four creditors.

The company is a Delaware corporation incorporated in February, 1913, with a capital stock of $3,000,000. E. R. Perkins is president.

Judge Mayer appointed B. W. B. Brown receiver under a bond of $5,000 and authorized him to carry on business for 10 days. The attorneys for the creditors state that the liabilities are between $60,000 and $70,000 and assets are over $60,000.

A note for a large amount is about to mature and the company could not meet it.

New England — The Realm of the Automobile Tourist

(*Continued from page* 749)

eighty over a year ago. Pennsylvania held up well, Kentucky dropped five and Tennessee gained four. The figures follow:

Border Line Group

	1912	1913	1914
New York	209	220	300
Pennsylvania	78	80	81
West Virginia	0	1	0
Kentucky	4	9	4
Tennessee	6	5	9
Totals	297	315	394

The Far West group now has seven states to four a year ago, Arizona, Colorado and Oklahoma coming in. But there was a decline despite this fact, and it shows a loss of nine, as follows:

Far West Group

	1912	1913	1914
Texas	8	10	9
Kansas	1	9	4
Nebraska	4	3	0
California	7	4	1
Arizona	0	0	1
Colorado	2	0	1
Oklahoma	0	0	1
Totals	22	26	17

The foreign group shows a gain of seven, with Germany and Portugal being added this year to the list, an encouraging showing. Here are the figures:

Foreign Group

	1912	1913	1914
Canada	2	3	7
Puerto Rico	2	4	3
England	0	1	1
Germany	0	0	1
Portugal	0	0	1
Cuba	1	1	3
Honolulu	1	0	0
Brazil	1	0	0
Totals	7	9	16

Here are the recapitulated figures:

Totals for All Groups

	1912	1913	1914
New England	102	105	148
Atlantic Coast	101	143	150
Middle West	142	146	154
Border Line	297	315	394
Far West	22	26	17
Foreign	7	9	16
Totals	671	744	879

Places Represented

	1912	1913	1914
Number of States	30*	32*	34*
Foreign Countries	5	4	6
Totals	35	36	40

*Includes District of Columbia.

Electric Vehicle Convention Opens—European Development

(*Continued from page* 755)

mail work and early in 1914 thirty 2.5-ton Electro-Daimler wagons.

Paris Refuse Disposal

Paris has what is said to be the most elaborate system of household waste disposal in existence. About 2,600 tons are handled per day or 900,000 tons per annum. Before motor vehicles came into use 730 carts, 1,500 horses and 3,000 men were required to handle the work.

This spring a modern system of far-reaching effect was inaugurated. This contemplates the use of electric trucks and five large consuming plants as a substitute for horse wagon methods and the flooding of the Seine flats with the waste material. Two of the incinerators have been built; one at Ivry-Port and one at St. Ouen. Forty-eight electric carts are used at the former plant and forty at the latter.

Future Is Bright

The carts are charged in two garages built by the city of Paris in the immediate vicinity of the incinerators. They are at present owned and operated by a stock company which is paid a certain price per cart kilometer, the city of Paris having the right to purchase the carts outright in 4 or 5 years at an agreed price.

While the war must invariably hamper industry in many lands, I should say that, discounting the war, **the outlook for the electric vehicle in Europe is decidedly brighter than at any time in the last decade.** I have not gone into the development or use of vehicles in Spain, Switzerland or Italy. There are some electrics used even in Russia. Last spring plans were under way to build 1,200 light weight passenger electrics at one plant in England, an encouraging sign. The war will undoubtedly retard immediate construction of all types of electrics, but the conflict may help the cause of the storage battery vehicle in all the countries where horses and gasoline vehicles have been commandeered.

French Automobile Regulations Are Growing Stricter

(*Continued from page* 751)

ers were decidedly annoyed at this action on the part of the heads of the French and English tire industry and expressed their dissatisfaction so forcibly that at the end of a couple of weeks the English company resumed business on the original basis. The curious feature of the situation is that both these companies took advantage of the patriotic wave, announcing 'Business as Usual,' 'Follow the Flag,' 'Stand by the Old Country,' 'Support British and French industries,' etc.

"Practically our entire stock of tires, both at the factory and at the Paris stores, was requisitioned by the Government. These tires were left in our hands, but could not be sold to the public, the army having the right to call for them at a moment's notice and pay for them according to a pre-established tariff, which is practically the price paid by dealers. There was no interruption in the production of band tires for trucks, but practically all we produced was taken up by the army. The strict regulations under which we have existed for a couple of months have been somewhat relaxed of late. We have been able to begin, on a small scale, the production of pneumatic tires and also to offer some of our stock to the public. It is expected that within a few days arrangements will be completed whereby we can export to England, thereby supplying the European countries not involved in the war. We have continued to do a certain amount of business with those parts of France not occupied by the armies, but the difficulty here has been the lack of shipping facilities. We have never experienced any difficulties with regard to the supplies of raw rubber and fabric."

Although Mr. Lumsden is optimistic regarding the future, he has to admit that the Goodrich company, in common with others, will have to bear losses.

Factory Miscellany

WILLARD Battery Co.'s New Plant—The Willard Storage Battery Co., Cleveland, O., manufacturer of the LBA battery, states that ground for its new plant was broken on September 24, and that the work of construction will be pushed forward as rapidly as conditions will permit. Ten acres of ground was purchased on East 131st street, occupying numbers from 256 to 294. The plant will contain 6 acres of floor space, leaving ample land for further expansion. Ten buildings will comprise the plant under existing plans. All buildings will be of brick, of the latest approved and most up-to-date construction and equipped with sprinkler system throughout. The various buildings will be entirely separate, sufficiently isolated from each other to insure adequate protection from fire and to furnish the maximum of light and air. The offices of the company will be housed in a handsome administration building two stories in height. The accounting, cost and purchasing departments, with necessary private offices, will be located on the first floor. The second floor will be devoted to a series of private offices for executives and heads of departments, with ample provision for order and filing departments, drafting room, etc. In a separate building dining rooms will be provided and equipped for the use of office and factory employees, and noonday lunches will be furnished at nominal cost. Throughout the plant especial care will be given to sanitation and adequate up-to-date equipment of bath rooms, dressing rooms, lockers, etc., will be installed. A feature of the plant will be a complete hospital for the care of employees, which will be under the supervision of a physician regularly employed by the company. It is the intention of the company to have the administration and several other buildings under roof before snow flies, so that they may be ready for occupancy as soon as practical in the early spring. A switch track from the Belt Line Railway, which communicates with all railroads entering Cleveland, will extend the entire length of the plot in close proximity to the end of each building. On this switch there will be ample space for twenty-five freight cars, and suitable shipping and receiving platforms will be built.

Chester Rubber to Enlarge—The Chester Rubber Tire & Tube Co., Chester, W. Va., has purchased additional ground and will enlarge its plant.

Benford Co.'s Plant—Plans are being prepared for a factory, 40 by 110 feet, for the Benford Mfg. Co., Mount Vernon, N. Y., manufacturer of spark plugs.

Goodyear Subsidiary Building—The Killingly Mfg. Co., Williamsville, Conn., a subsidiary of the Goodyear Tire & Rubber Co., Akron, O., will build a factory which will be used for making cotton duck for automobile tires.

$100 for a Name—The W. H. McIntyre Co., Auburn, Ind., manufacturer of Imp cars, is offering $100 to the person who suggests the best name for its two new models, of two-passenger and four-passenger design, electrically started and lighted and listing between $400 and $600.

Standard Truck's New Plant—The Standard Motor Truck Co., of Warren, O., has purchased a portion of the plant of the Day-Ward Co. on North Park street, Warren, O., which is being remodeled for occupancy after November 1.

To Manufacture Enamel—The Won Kote Enamel Co. has been organized by Paul Fuchs, F. J. Wirtz and F. Ed. Spooner, with headquarters at 903 Free Press Building, Detroit, Mich., and a manufacturing plant in Ravenswood, Ill.

Tire Co. in Harrison—The Auto Tire & Thread Co. has leased a factory building at Cross and Fifth streets, Harrison, N. J., formerly occupied by the Greenfield Engine Co., and will establish a plant for the manufacture of its specialties.

Ware Plant in St. Paul—A plant for the manufacture of Ware motor trucks will be erected in St. Paul, Minn., by J. L. Ware, president of the company. The structure will be 200 by 90, reinforced steel and concrete construction, to cost $40,000.

Saxon Making Foreign Shipments—During the first 10 days of this month Saxon Motor Co., Detroit, Mich., has shipped cars to South America, British Guiana, the Philippines and Canada, and has received several inquiries from dealers in other countries.

Monroe Co. Acquires Wheel Plant—The Monroe Motor Co., Flint, Mich., has been incorporated with $250,000 capital stock to manufacture automobiles. R. F. Monroe, U. C. Durant and A. B. C. Hardy are among the incorporators. It has acquired the plant of the Imperial Wheel Co.

Henderson Plant and Parts Sold—Samuel L. Winternitz & Co., auctioneers of Chicago, on October 14 sold at public auction the plant, finished cars, material, parts and accessories, machinery, equipment and fixtures of the defunct Henderson Motor Car Co., Indianapolis. The sale was conducted in piece-meal.

Ahlberg Co. Opens Factory—The Ahlberg Bearing Co. has opened a factory and office in Los Angeles, Cal. This company specializes in regrinding annular ball bearings. J. W. West, formerly of Chicago, who has made his home in Los Angeles during the past year, will be associated with the company.

Oxford Plant Closed—The plant of the Oxford Motor Cars & Foundries, Ltd., Maisonneuve, Montreal, Que., has closed down for the present on account of the present war and the financial stringency. The company expects to resume business next spring. The Oxford 1915 models will be identical with the present ones.

Sub-Casing Plant Sold—The Fisher Mfg. Co., makers of the Fisher rim-grip sub-casing, has sold its entire Los Angeles plant and manufacturing rights to the Western Auto Sub Casing Co. The new company is headed by a group of capitalists of Seattle, Wash. M. S. Williams is the president of the new concern; A. T. Griffin, vice-president, and H. S. Nettleton, secretary and treasurer.

Page Windshield Co. Will Increase Force—The Page Woven Wire Fence Co., Adrian, Mich., which makes a specialty of windshields for Ford cars is now making from 300 to 400 a day and will soon have a total force of 150 men in its factory. In addition to the Ford windshields others are also manufactured.

Shaw Motor's New Plant—The Shaw Motor Co., Chicago, Ill., has decided to establish its plant in Sauk City, Wis., and has plans for a factory which will cost between $30,000 and $40,000 with machine and tool equipment. The building will be 60 by 108 feet in size, one story high, of fireproof construction, and equipped for the production of multiple cylinder gasoline engines.

May Buy G. M.'s Clyde Plant—Representatives from the East Palestine Tire & Rubber Co., East Palestine, O., recently visited the abandoned plant of the General Motors Company at Clyde, O., with a view of purchasing the plant and equipping it as a tire factory to be operated as a branch of the East Palestine concern. It is said that in case the purchase is made the plant will have a capacity of 500 tires daily.

Takes Over Michigan Spring Business—The General Spring & Wire Co., Detroit, Mich., has taken over the business of the Michigan Spring & Wire Co., 932 Mack avenue. The new company, which has a capital stock of $10,000, will make a specialty of wire springs for automobiles. J. H. Clark is president of the new concern; August Peterson, vice-president; C. L. Clark, secretary, and J. N. Reid, treasurer.

Williams Co.'s Plant in Vista—A. D. Williams, president of the Williams Tire Co., Glassport, Pa., announced recently that his company had acquired 10 acres of land on the Caleb Hamilton farm in Vista, 6 miles above McKeesport, on the Baltimore & Ohio Railroad. Work will begin within a few weeks on a new plant for the manufacture of tires, tubing and other rubber articles. The plant is expected to begin operation in the spring and will employ about 500 men and boys. The capital stock of the company has been increased from $5,000 to $300,000, with $60,000 of the new issue subscribed for, according to Mr. Williams.

Morton Truck's Big Order—The Morton Truck & Tractor Co., Harrisburg, Pa., according to an announcement of one of its officials, has just closed a contract with E. B. Van Atta & Co., of New York City, for 100 trucks of different sizes to be delivered within a year. The order totals about $300,000. Another order has been placed with a Buenos Ayres company for a large number of tractors, to be delivered from ten to twenty-five a month. The company recently purchased the new building of the Model Typewriter Co., on Nineteenth street, and is occupying this property. It is a three-story brick structure. The officers of the company are: S. F. Dunkle, president; J. V. Kuntze, vice-president; John Campbell, treasurer, and Walter Morton, secretary and manager.

The Week in the Industry

Motor Men in New Roles

FARR Resigns from Knox—H. G. Farr has resigned as chief engineer of the Knox Motors Co., Springfield, Mass., and will open an office in that city as consulting engineer. Mr. Farr was a pioneer of the industry, having, in conjunction with Harry A. Knox, designed one of the first successful gasoline cars in America. He has been with the Knox company since it started.

Atkinson White Sales Manager—Robert Atkinson has been named sales manager of the Seattle, Wash., branch of the White Co., Cleveland, O.

Clapp Sales Manager—C. J. Clapp has been appointed sales manager of the Paige-Toledo Co., Toledo, O., distributer in northwestern Ohio for the Paige cars.

Bump Studebaker Manager—F. R. Bump has succeeded Hanson Robinson as manager of the Studebaker agency in New York City. Mr. Robinson recently resigned.

Denvir Joins Federal Truck—J. P. Denvir has resigned from the Gibney Tire Co., New York City, and has been appointed assistant sales manager of the Federal Motor Truck Co., also of that city.

Hane Goes to Portland—J. P. Hane, who has been connected with the Cadillac agency in Los Angeles, Cal., and in Boston, Mass., has gone to Portland, Me., to act as sales manager for the Cadillac agency.

Rand Manager—C. D. Rand, of the Simplex-Mercer Pacific Coast agency, has been appointed San Francisco branch manager for that company, and takes the position from which Bert Latham has recently resigned.

Howe Goes to Providence—F. E. W. Howe, for some years with Alvan T. Fuller in Boston selling Packard cars, has been promoted to be manager of the Providence agency for that make, which is controlled by Mr. Fuller.

Heintz Republic Tire Manager—C. W. Heintz, for the past 5 years connected with the sales department here of the Republic Rubber Co., was appointed manager of the Buffalo, N. Y., branch, B. F. Morris having resigned.

White District Sales Agent—An office with temporary salesrooms has been opened in the Murray Building, Grand Rapids, Mich., by the Wayne Auto Supply Co., Detroit. N. A. White has been appointed district sales agent.

Fisher Acting Secretary—Paul Fisher, of St. Louis, Mo., is at present acting as secretary of the St. Louis Automobile Manufacturers and Dealers' Assn., a position he will formally take next spring when Capt. R. E. Lee's term expires.

Wollaver Makes a Change—H. B. Wollaver, formerly connected with the sales department of the Chalmers and Stearns-Knight agencies, has been made manager of the service department of the Henley-Kimball Co., agent for the Hudson in Boston, Mass.

Boland Manager Jackson Branch—A factory branch has been opened in Council Bluffs, Ia., by the Jackson Automobile Co., Jackson, Mich. T. J. Boland, formerly with the Pioneer Implement Co. in this city, is manager of the branch, which will look after the business in certain sections of Iowa, Nebraska and South Dakota.

Brownlee Purchases New Interests—The Weaver-Brownlee Co., Cleveland, O., succeeds the Weaver-Twelvetree Co., H. J. Twelvetree's interests having been purchased by J. A. Brownlee, who has been connected with the Philadelphia Pierce-Arrow agency for a number of years. He will have charge of all Pierce-Arrow pleasure car business, and becomes vice-president of this company.

Garage and Dealers' Field

Empire in Boston—The Empire Motor Sales Co. has established its own branch in Boston, Mass., securing salesrooms at 1002 Boylston street, near Massachusetts avenue.

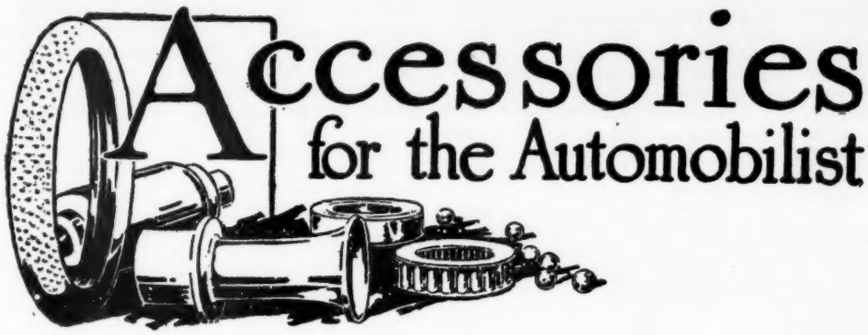
Automobile Street Cars in Pendleton—The first real automobile street cars to be placed in service in Oregon have been installed at Pendleton, Ore., by the Pendleton Auto Street Car Co. G. K. Parker is at the head of this new transportation company. The cars have a seating capacity of forty people each.

Champion House Warming—About seventy automobile engineers and purchasing agents from Detroit and other automobile manufacturing companies were the guests at a house warming of the Champion Spark Plug Co., Toledo, O., October 10, to celebrate the recent amalgamation of the company with the Jeffery-Dewitt Co., Detroit.

New Departure Distributers—The New Departure Mfg. Co., Bristol, Conn., is establishing new distribution centers. The following additional distribution houses were established this past week: The Ahlberg Bearing Co., 325 West Pico street, Los Angeles, Cal.; The Chapin Co., Calgary, Alta., Canada; The Western Rubber & Supply Co., San Francisco, Cal.

The Automobile Calendar

Oct. 17-23.....Los Angeles, Cal., Show, Shrine Auditorium.
Oct. 17-24.....Pittsburgh, Pa., Automobile Show, Auto Dealers Assn., Inc.
Oct. 17-Nov. 1....Dallas, Tex., Show, State Fair Grounds, Dallas Automobile Dealers' Assn.
Oct. 19, 20, 21....Philadelphia, Pa., Elec. Veh. Assn's Convention.
Oct. 19-26.....Atlanta, Ga., American Road Congress of the American Highway Assn. and the A. A. A.
Oct. 23-24.....Peoria, Ill., Illinois State Assn. of Garage Owners; Semi-Annual Convention.
Oct. 27.....Indianapolis, Ind., Good Roads Day, Lincoln Highway.
Oct. 28.....New York City, Commercial Tercentenary Celebration.
Oct. 28-31.....Milwaukee, Wis., Convention, Northwestern Road Congress, Auditorium.
Nov. 2-6.....Boston, Mass., Salon, Copley Plaza Hotel.
Nov. 3.....Long Island A. C. Century Run.
Nov. 7-8-9.....Los Angeles, Cal., Los Angeles-Phoenix Road Race, Maricopa Auto Club.
Nov. 8-9.....El Paso, Tex., El Paso-Phoenix Road Race, El Paso Auto Club.
Nov. 8-11.....Shreveport, La., Track Meet, Shreveport Auto Club.
Nov. 12.....Phoenix, Ariz., Track Race, Maricopa Auto Club.
Nov. 17-18-19....Harrisburg, Pa., Second Conference of Pa. Industrial Welfare and Efficiency, State Capitol.
Nov. 26.....Corona, Cal., Road Race, Corona Auto Assn.
Dec. 1-4.....New York City, Annual Meeting of the American Society of Mechanical Engineers.
Dec. 12-19.....Akron, O., Show, Akron Auto Show Co., O'Neill Bldg.
Jan. 2-9.....New York City, Annual Automobile Show, Grand Central Palace
Jan. 3-10.....Buenos-Aires, Argentina, Grand Prize of Argentina.
Jan. 9-16.....Philadelphia Show.
Jan. 11-16.....Buffalo, N. Y., Show, Broadway Auditorium, Automobile Club of America.
Jan. 23-30.....Chicago, Ill., Automobile Show, First Regiment Armory.
Jan.30-Feb. 6....Minneapolis, Minn., Show, National Guard Armory, Minneapolis Automobile Trade Assn.
Feb.....Portland, Ore., Show, Portland Auto. Trade Assn.
Feb. 15-20.....Omaha, Neb., Show, Auditorium, C. G. Powell.
Feb. 22.....San Francisco, Cal., Vanderbilt Cup Race, Panama-Pacific Exposition Grounds; Promoter, Panama-Pacific Exposition Co.
Feb. 23-27.....Syracuse, N. Y., Show, Syracuse Auto. Dealers' Assn.; H. T. Gardner, Mgr.
Mar. 6-13.....Boston, Mass., Show, Mechanics Bldg., Boston Auto Dealers Assn. Boston Commercial Motor Veh. Assn.
Mar. 7.....San Francisco, Cal., Panama-Pacific Exposition, Grand Prize Race, Panama-Pacific Exposition Grounds; Promoter, Panama-Pacific Exposition Co.
Mar. 9-15.....Des Moines, Ia., Show, C. G. Van Vliet.
Mar. 14.....San Francisco, Cal., Panama-Pacific Cup Race, Panama-Pacific Exposition Grounds; Promoter, Panama-Pacific Exposition Co.



Accessories for the Automobilist

ATTACHO Lamp — A trouble lamp which can be operated from any lighting circuit and fitted with a clamp which allows the lamp to be attached to any place convenient to the work, is manufactured by R. S. Mueller, 423 High avenue, S. E., Cleveland, O. It is shown in Fig. 1 attached to the top of a table. The jaw of the clamp has a 2⅛-inch opening. In addition there is a hook on the end of the clamp so that the lamp may be hung to anything suitable. The lamp may be swung through an arc of 180 degrees, as shown, and the shade may be rotated as desired so that the light may be directed just where it is wanted.

The use of an 8-candle power lamp is recommended. Twenty feet of cord are furnished. The price complete is $3 and without cord and plug $2. The postage is prepaid in either case.

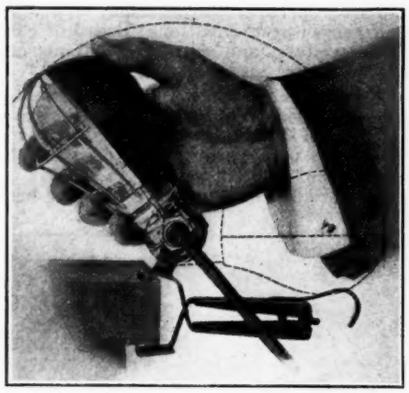


Fig. 1—Attacho trouble lamp

Stevens Pressure Gauge—A new type of pressure gauge for tires is announced by the Stevens Supply and Mfg. Co., Chicago, this new gauge being adjustable so as to make corrections for changes in spring tension. This gives the gauge the feature of reading accurately throughout its life, provided the tension of the spring is altered when required. Another feature is that the reading is not lost after the gauge is removed from the tire, allowing the pressure gauge to be used in the dark and then carried to a light to be read. The gauge with its end cap removed is shown in Fig. 2. The small part protruding pushes down the tire valve stem. The Stevens sells for $2.25.

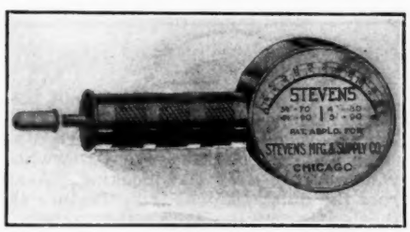


Fig. 2—Stevens tire pressure gauge

Breeze Two-Fuel Adapter — Claiming that the ordinary motor will give better results if a mixture of kerosene and gasoline is used instead of gasoline alone the Breeze Carbureter Co., Newark, N. J., is offering a device for controlling the flow of the two fuels to the vaporizing device. By the use of this system, which is controlled from the dash, either gasoline or kerosene or a mixture of the two in various proportions may be fed to the carbureter, or no fuel at all may be fed, allowing the motor to suck air. The last named feature is valuable when descending hills, in which event the motor may be made to act as a brake and cooled by the frequent changes of air. The Breeze device consists of a two-way valve, as shown in Fig. 3, and a regulating device on the dash controlling the valve openings by a wire. With this system it is possible to start the engine on gasoline and then, after sufficient heat has been generated and the motor can accommodate the heavier fuel, the kerosene is switched on, or part kerosene and part gasoline used. The entire outfit sells for $5.

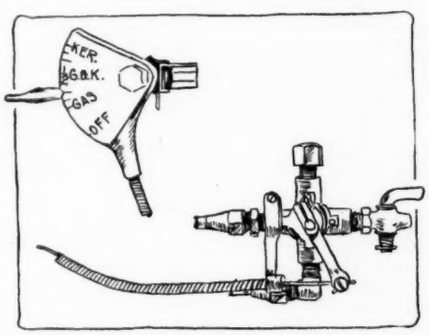


Fig. 3—Breeze two-fuel adapter

Weaver Garage Press—Garagemen will be interested in the Weaver press, which has a capacity of 20 tons, and performs such work as straightening shafts, pressing wheels on shafts, compressing springs, straightening frames, etc. This press is manufactured by the Weaver Manufacturing Co., Springfield, Ill., and is made of jointless channel steel. For light work, the 15-inch wheel, shown in Fig. 4 is sufficient to provide quick action, but for heavy work, a lever arrangement is provided which affords a leverage of about 1,500 to 1 and enables the maximum pressure of 20 tons to be exerted. The press sells for $48 complete with lever attachment.

Hupp-Yeats Worm Axle—The new Hupp-Yeats Electric Car Co., Detroit, Mich., has recently brought out a worm-driven axle for the cars of this make already in the hands of owners.

The application of the motor to rear axle housing has been worked out so that it is identical with the old construction; that is to say, the motor suspension is the same.

The motor shaft is attached to the worm shaft by a short coupling, and the motor head is bolted to the flange on the worm housing by the studs in present use on the motor head.

The new axle comes painted, with motor coupling ready to be applied to end of motor shaft and end of worm shaft, and with holes accurately drilled in worm housing to take the motor studs attached to motor end plate. The axle will be identical with axles in service with the exception that it will have a smaller housing to house the worm gear. The mechanical difficulties to make axles interchangeable have all been worked out so nicely that the new axle will go under the car in place of the old without any special adjustments and can be quickly and easily applied by the most ordinary mechanic or garage man.

The price of the new axle, taking old axle in exchange and delivered free of transportation charge at Detroit, is $200 net cash f.o.b. Detroit. This includes the motor shaft and worm shaft coupling.

Forest City Combination Holder—Another accessory for Ford cars, in the shape of a license pad and starting crank holder, is announced by the Forest City Electric Co., Cleveland, O. The holder is applied to the front of the car under the shackle bolt nuts. It serves to hold the starting crank handle in an upright position and also forms a support for the license plate. It sells for $1.

New Ford Coils—The Ford Motor Co. now is supplying new coil equipment for model T cars built previous to 1914. The new coils have tungsten instead of platinum points, and are claimed to retain their adjustment for a longer period. The Ford company claims more satisfactory service can be obtained with the new

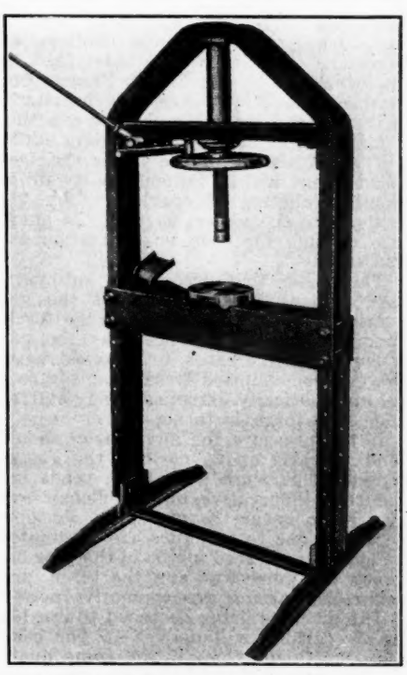


Fig. 4—Weaver garage press

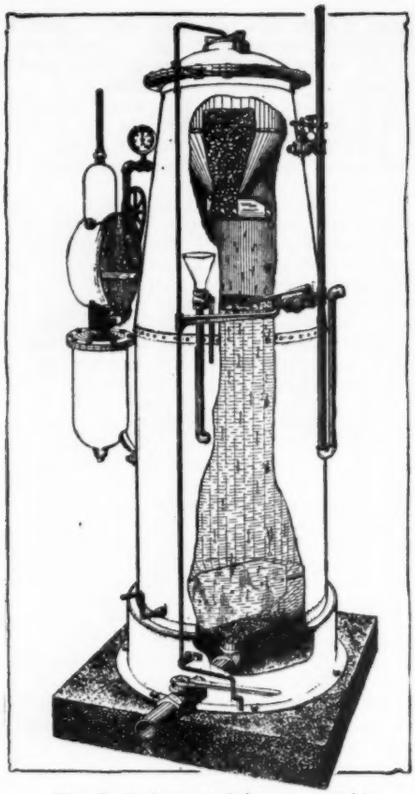


Fig. 5—Vulcan acetylene generator

coils than with the older ones. The price is $10 if the old coils are returned.

Edison Electric Vehicle Lamp — The Edison Lamp Works of the General Electric Co. has added a new Mazda tail lamp to its line of electric vehicle lamps. The new lamp is of 8 watts, 24 to 90 volts of the regular concentrated filament construction. It is of 1¼-inch diameter with a maximum over all length of 2¼ inches. It is fitted with either double or single contact bayonet candelabra base to operate in the standard tail light.

Vulcan Acetylene Generator — An acetylene generator which employs an ingenious method of carbide feed is manufactured by the Vulcan Process Co., Minneapolis, Minn., and Cincinnati, O. It is designed especially for the exacting demands of an autogenous welding outfit.

The feature of the device is the feed mechanism which automatically drops small briquettes of carbide ⅜ by 1¼ inches into the water, varying the quantity to suit the demands made on the gas supply.

The motor that drives this automatic feed utilizes the buoyancy of the gas passing from the generator to the torch, thus the feed is increased as the gas consumption increases, or lessened when the gas consumption lessens, or the feed is automatically stopped and started when the torch is turned off or on.

If the pressure for any reason should tend to raise above normal, the gas is conducted through a by-pass, rendering the feed inoperative until sufficient gas is used to lower the pressure. Possible accidents due to puncture are eliminated by locating the feed motor in the pipe between the generator and the torch, and using the passing gas as motive power.

The machine being designed to use 1¼ by ⅜ carbide will deliver 15 per cent. more acetylene than if the same quantity of screenings of carbide was used and better gas results from the carbide falling deep into the water before complete decomposition ensues, securing cooler generation under higher temperature than is possible with screenings which has a tendency to decompose near the surface, causing failure to give the gas the benefit of rising through a considerable volume of water, whereby it is washed and cooled.

The carbide chamber and feed mechanism are removable, thus opening the machine for complete inspection. The entire generator is protected by patents against careless manipulation by a locking device which prevents removing the cap for refilling or opening any valves, without following a definite safe routine.

This generator was recently approved and passed by the National Board of Fire Underwriters, and therefore will not increase insurance rate, it is stated.

New Cameron Wire Wheel for Fords—The Cameron Wire Wheel Co., Detroit, is making a new detachable Ford wire wheel, by use of which it is possible to make a change of tires on the road in 30 seconds, it is claimed. The wheel is held

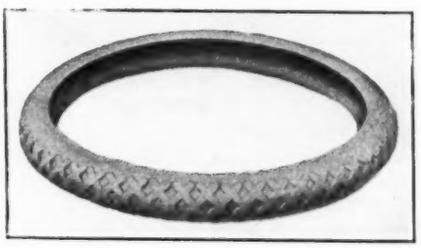


Fig. 6—Mohawk retread band

in place by an outside locking nut that can be removed with an ordinary wrench. Driving is done by large taper studs which are designed to prevent the wheel from wearing loose or squeaking. Aside from the quick tire changing feature the wheels improve the car's appearance. A set of five wheels and four inner hubs, complete with bearings, brake drums and nickeled hub caps, costs $35.

Thermoplax for Radiator Caps—A black composition known as Thermoplax is being marketed by the Cutler-Hammer Co., Milwaukee, as suitable material for radiator caps. It is said the material will withstand a temperature range from 30 to 600 degrees F. The substance is easily molded into shape around a metal insert.

Mohawk Retread Band—A semi-cured, endless band of rubber with a non-skid surface designed to be vulcanized over tires calling for retreading is announced by the Mohawk Rubber Co., Akron, O. This band cannot be applied except by vulcanization and requires the same heaters and tools that are necessary in applying a plain retread. The band is made in the following sizes: 30 by 3½, 32 by 3½, 32 by 4, 34 by 4, 34 by 4½ and 35 by 5, which takes care of practically all the standard diameters in use for in nearly every case one size, if stretched, will do for many. The band is cured in a mold and shaped so that it wraps closely to the tire carcass. The inside of the band has upon it a layer of pure gum which gives the vulcanizing cement a firm hold. The band is shown in Fig. 6.

Alemite Drill Stand—The Stromberg Motor Devices Co., 64 East Twenty-fifth street, Chicago, Ill., is distributing a handy device for holding tools. It consists of a die casting, Fig. 7, containing two circles of holes in which the drills are carried. The device is made in two sizes, both of which sell for $2. One is designed for drills 1 to 60 and the other for drills from 1/16 to ½ inch by sixty-fourths.

It is claimed that this drill stand will save much time and money wherever drills are used to any extent. The time spent in locating a drill from among a dozen small tools on a bench—or in finding the drill desired from an ordinary drill block or stand, or in walking back and forth from machine to bench to change drills—will soon pay for the drill stand.

The handle of the stand makes it easily portable and the drills are always accessible—a twist of the hand turns the stand until the number of the desired drill is brought to view.

Under each drill is the drill number in large, black figures and below these are the sizes of the drills in decimals. The drill stand is not only a container for these tools, but is also a gauge as well. The holes are so accurate that only the proper drill will fit.

S. & B. Tube—The S. & B. Mfg. Co., Worcester, Mass., is marketing the S. & B. tube, an ingenious device for carrying the operator's license and registration certificate. It comprises a compact, hollow cylinder, about the same length and weight as an ordinary key, and it is attached to the key ring. The capacity of the tube is such that it will accommodate the license or certificate, which is rolled up.

The device will appeal to motorists who frequently change their clothes and who might neglect to place their certificates in the new apparel. Being attached to the key ring, it is pointed out that one is less liable to forget it when changing. The S. & B. tube retails for 25 cents.

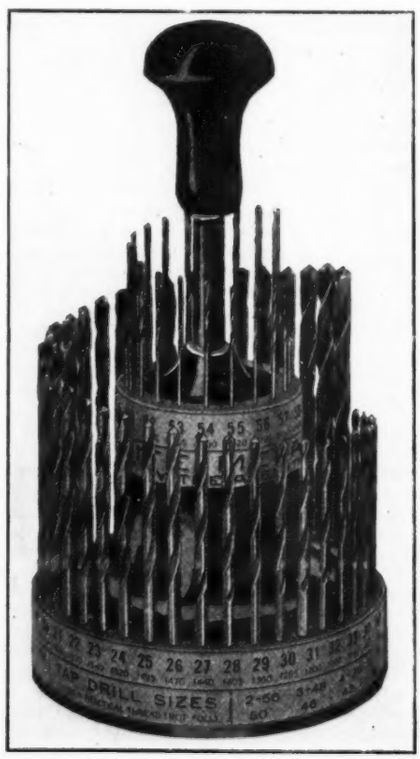


Fig. 7—Alemite drill stand, which is handy for carrying drills about the shop, etc.